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FOREST BIOLOGY RANGER ANNUAL REPORTS

ALBERTA

1960

INTERIM REPORT

FOREST BIOLOGY LABORATORY

CALGARY, ALBERTA

CANADA DEPARTMENT OF AGRICULTURE

RESEARCH BRANCH

FOREST BIOLOGY DIVISION

March, 1961

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CANADA DEPARTMENT OF FORESTRY
Forest Entomology & Pathology Branch
Forest Entomology & Pathology Laboratory
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FOREST BIOLOGY RANGER REPORTS

ALBERTA

(Forest Insect and Disease Survey No. 30.01-6)

by

J. K. Robins, J. Watson, P. F. Larue, J. Petty,

V. B. Patterson, N. W. Wilkinson,

F. J. Emond, A. Machuk, G. Smith

INTERIM REPORT 1960

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

(Based on investigations carried out in 1960)

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH, 1961

(This report may not be published in whole or in part without the written consent of the Chief, Forest Biology Division, Research Branch, Department of Agriculture, Ottawa, Canada.)

FOREST BIOLOGY RESEARCH REPORTS

ALBERTA

(Forest Management and Research Survey No. 30, 1951)

by

J. L. McPherson, J. L. McPherson, J. L. McPherson, J. L. McPherson, J. L. McPherson

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INTERIM REPORT 1950

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

(Based on material collected out in 1950)

CANADA

DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH, 1951

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INTRODUCTION

Forest insect and disease conditions in Alberta, the Rocky Mountain National Parks and the Mackenzie District of the Northwest Territories were surveyed in 1960 by a field staff of 8 Forest Biology Rangers from the Forest Biology Laboratory in Calgary. In the course of these surveys 96,000 miles were travelled by motor vehicle, 4,800 miles by air and 1,650 by boat; 1,710 insect and 124 disease samples were taken.

FIELD STAFF ASSIGNMENTS

A number of resignations in 1959 resulted in 3 new Rangers joining the field staff in 1960. John Watson transferred from a position as field technician to replace Kim Andrews in the Crowsnest-Bow River District, Tony Machuk came from the Winnipeg Laboratory to take over the Peace River District, vacated by R.R. Stanley, and Gordon Smith replaced Glen Bigelow in the Northwest Territories District. District assignments and divisional responsibilities were as follows:

Southern Division

District 1	Crowsnest-Bow River	John Watson	F.B.R. Gr. I
District 2	Clearwater	Paul LaRue	F.B.R. Gr. I
District 3	National Parks	Jack Petty	F.B.R. Gr. II

Central Division

District 4	Brazeau-Athabasca	Vern Patterson	F.B.R. Gr. II
District 5	Lac la Biche	Norm Wilkinson	F.B.R. Gr. I

Field Staff Assignments - cont'd.

Northern Division

District 6	Slave Lake-Grande Prairie	Jim Emond	F.B.R. Gr. I
District 7	Peace River	Tony Machuk	F.B.R. Gr. II
District 8	Northwest Territories	Gordon Smith	F.B.R. Gr. I

ACCOMMODATION

In the fall of 1960 a pre-fabricated log cabin and a storage shed of standard design were constructed in the city of Grande Prairie, bringing the number of permanent field headquarters to 5, the remaining 3 districts being served by house trailers. Headquarters grounds were landscaped at Crimson Lake, Lac la Biche and Entrance. A new fence was built and the water system was improved at Entrance.

TRANSPORTATION

Motor vehicles in use by Forest Biology Rangers during 1960 consisted of 5 one-ton winch-equipped panel trucks in the northern districts, 2 half-ton panel trucks in the southern districts, and a sedan delivery in the National Parks District. The outboard cruiser "Borealis" was used on the Mackenzie River and a 17 foot freight canoe on the Peace River.

AERIAL SURVEYS

The use of aircraft in forest insect and disease surveys was down about 20 per cent from 1959. A total of 48 hours 20 minutes was flown by Forest Biology Rangers compared to 57 hours in 1959. This decrease resulted from reduced aerial activity in the Northwest Territories where aerial surveys were confined to the area in and around Wood Buffalo Park.

AERIAL SURVEYS cont'd.

During the early part of July, 4 flights were flown in an aspen defoliation survey. The larch sawfly outbreak in Northwestern Alberta was surveyed on 2 flights in early September. In the Northwest Territories, the Department of Northern Affairs and Natural Resources supplied 8.5 hours of flying time for the survey of larch sawfly and spruce budworm outbreaks in and around Wood Buffalo Park.

SUMMARY OF INSECT CONDITIONS

Larch sawfly, Pristiphora erichsonii (Htg.)

The status of the larch sawfly outbreak in Alberta and the Northwest Territories showed little change from 1959. The known distribution was extended northward to a point 46 miles north of Providence. A heavy infestation now occupies a large area in northern Alberta and the adjacent Northwest Territories from a line through Lac la Biche and Lesser Slave Lake to the south shore of Great Slave Lake and from the Saskatchewan border west to a line running south from Pine Point through the Cameron Hills and Fort Vermilion to the west shore of Lesser Slave Lake. Other smaller heavy infestations were found near Elk Island Park and in the Caroline-Sylvan Lake-Rocky Mountain House area. Moderate defoliation of larch occurred west of this area and at scattered locations throughout the remainder of the infestation. Elsewhere damage was light.

Spruce budworm, Choristoneura fumiferana (Clem.)

In 1959 an aerial survey of the spruce budworm infestation along the Mackenzie River revealed a general decline in populations. In 1960 the trend was reversed with localized increases in damage evident at many points. Severe damage to white spruce occurred at the mouth of the Blackwater River. Moderate damage was evident from Fort Simpson to the airport, in patches between old Fort Island and Smith River, between the Ochre and Johnson rivers, and from Old Fort Point to Fort Norman. No survey of the infestation on the Liard River was made in 1960. On the Slave River the outbreaks around Long Island and downstream from the Salt River persisted with moderate to severe damage in evidence. Light to moderate damage to white spruce, around Loon Lake in north-central Alberta, observed during an aerial survey, was attributed to the spruce budworm.

Little change in the extent or intensity of the outbreaks in the Cypress Hills or in the National Parks was noted.

Forest tent caterpillar, Malacosoma disstria Hbn.

A general increase in tent caterpillar populations was evident in a broad band running from Elk Point in east-central Alberta, westward to the Peace River Block and northward to Fort Vermilion.

The infestation around Elk Point, first noted in 1957, has expanded to encompass over 4,000 square miles, with smaller areas heavily defoliated near Ashmount, Boyle, Wandering River and Cold Lake. Large areas of moderate defoliation were found west of this large area of heavy defoliation.

Heavy defoliation occurred along the Peace River in a band about 20 miles in width, from the Cadotte River to about 10 miles southwest of Fort Vermilion, in a triangle formed by Donelly, Watino and Peace River, from Bluesky to Cardinal Lake and near Sturgeon Lake. Smaller areas of moderate and heavy defoliation occurred throughout the Peace River region.

Moderate to severe damage to aspen was in evidence in the Whitecourt-Blue Ridge area, southeast of the Little Smoky Settlement and around Fawcett Lake.

OTHER NOTEWORTHY INSECTS

INSECT SPECIES	REMARKS
Aspen leaf miner, <u>Phyllocnistis populiella</u> Chamb.	Found in most aspen stands in Alberta in 1960. Heavy infestations in Jasper and Kootenay National Parks and south of Goodwin.
Bruce spanworm, <u>Operoptera bruceata</u> (Hlst.)	Found in very low numbers in 1960. High populations were found at only 2 locations, near Islay and between Halkirk and Coronation.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	Infestation at Kootenay Crossing still active. Small infestations reported from north of Keg River, in Wood Buffalo National Park, north of Fort Providence and around Waterton Lakes National Park.
Fall cankerworm, <u>Alsophila pometaria</u> (Harr.)	Caused severe defoliation of Manitoba maple near Monarch, Turin, Purple Springs, Whitlaw and Jenner. Light populations in many shelterbelts from the International Boundary to the Red Deer River.

OTHER NOTEWORTHY INSECTS cont'd.

Leaf rollers on aspen,
Pseudexentera improbana oregonana Wlsh. Choristoneura conflictana (Wlk.) and Compsolechia niveopulvella Cham.

P. improbana oregonana found in outbreak proportions near Stony Plain, Saskatoon Lake, Wanham, Woking and Rycroft, and in scattered locations in east-central Alberta. C. conflictana and C. niveopulvella found in endemic numbers only.

Lodgepole needle miner,
Evagora starki Free.

Some evidence of population increases at Mount Eisenhower and Mount Girouard after remaining relatively constant for 6 years.

Spruce spider mite,
Oligonychus ununguis (Jac.)

Caused severe damage to white spruce in many areas in Peace River Block. Little damage reported from central and southern Alberta with the exception of Banff townsite where some moderate damage occurred.

Yellow-headed spruce sawfly,
Pikonema alaskensis (Roh.)

Caused moderate to severe damage to spruce shelterbelts northwest of Edmonton. Some light to moderate damage reported from Peace River Block. Moderate defoliation of native spruce on island in Peace River near the 25th. Baseline.

SPECIAL SURVEYS AND PROJECTS

Field personnel participated in the following special surveys, sub projects and co-operative projects in 1960, in addition to general detection and appraisal surveys:

(1) Larch sawfly sequential sampling techniques were continued at 30 sample plots established in Districts 2, 3, 4, 5, 6 and 7.

(2) Sequential sampling methods involving fall egg counts were carried out at 57 locations in the forest tent caterpillar outbreak in Districts 2, 4, 5, 6 and 7. The accuracy of the defoliation forecast obtained by these methods in 1959 was checked by visual defoliation estimates on all plots in 1960.

(3) Forest tent caterpillar egg bands and early instar larvae were kept under observation and weather records were taken at Lac la Biche from late April until early June. This project was set up in 1957 to study the effects of early spring weather on larval survival.

(4) The seasonal growth of lodgepole and Jack pine leaders was measured at 21 locations throughout the province as part of a phenology study began in 1948.

(5) Further information on spruce budworm development at northern latitudes was gathered from the outbreak on the Liard River above Fort Simpson.

(6) Spruce seed plots established by the Federal Forestry Branch in central and southern Alberta were again examined and the 1960 cone crop estimated.

(7) Mass collections of Bruce spanworms, balsam fir sawflies, tent caterpillars, spruce budworms and yellow-headed spruce sawflies were made for rearing in parasite studies.

(8) In response to requests for material for survey projects and to add to distribution records, special emphasis was placed on collections of the following insects; neodiprion sawflies on pine, root borers of aspen and alder, yellow-headed spruce sawflies in natural spruce stands, insects inhabiting black spruce crowns, cecidomiidae in spruce buds, vagabond galls on aspen, larch shoot moths, pitch nodule makers, bark inhabiting insects, leaf-eating beetles, dipterous blotch miners, 1 and 2 year cycle spruce budworms, prairie tent caterpillars, western tent caterpillars and others.

(9) Research workers in other laboratories were assisted by collections of Bruce spanworms, prairie and western tent caterpillars, pamphilid larvae, ugly nest caterpillars and Chilocorus spp.

TREE DISEASES

New outbreaks of tree diseases were again recorded on "Tree Disease Outbreak Sheets" and old recorded outbreaks were re-examined on a pre-arranged schedule. Special attention was given to the collecting of specimens of tree disease organisms affecting pines, with emphasis on dwarf mistletoe of pine, Atropellis canker of pine and red heartwood stain of pine caused by Peniophora psuedo-pini Weresub and Gibson.

Cool, damp weather during spring and early summer favored the development of needle rust of white spruce and black spruce caused by Chrysomyxa ledi de Bary and C. ledicola Lagerh., in an area centering around Whitecourt and extending to Slave Lake, Grande Prairie and Edson.

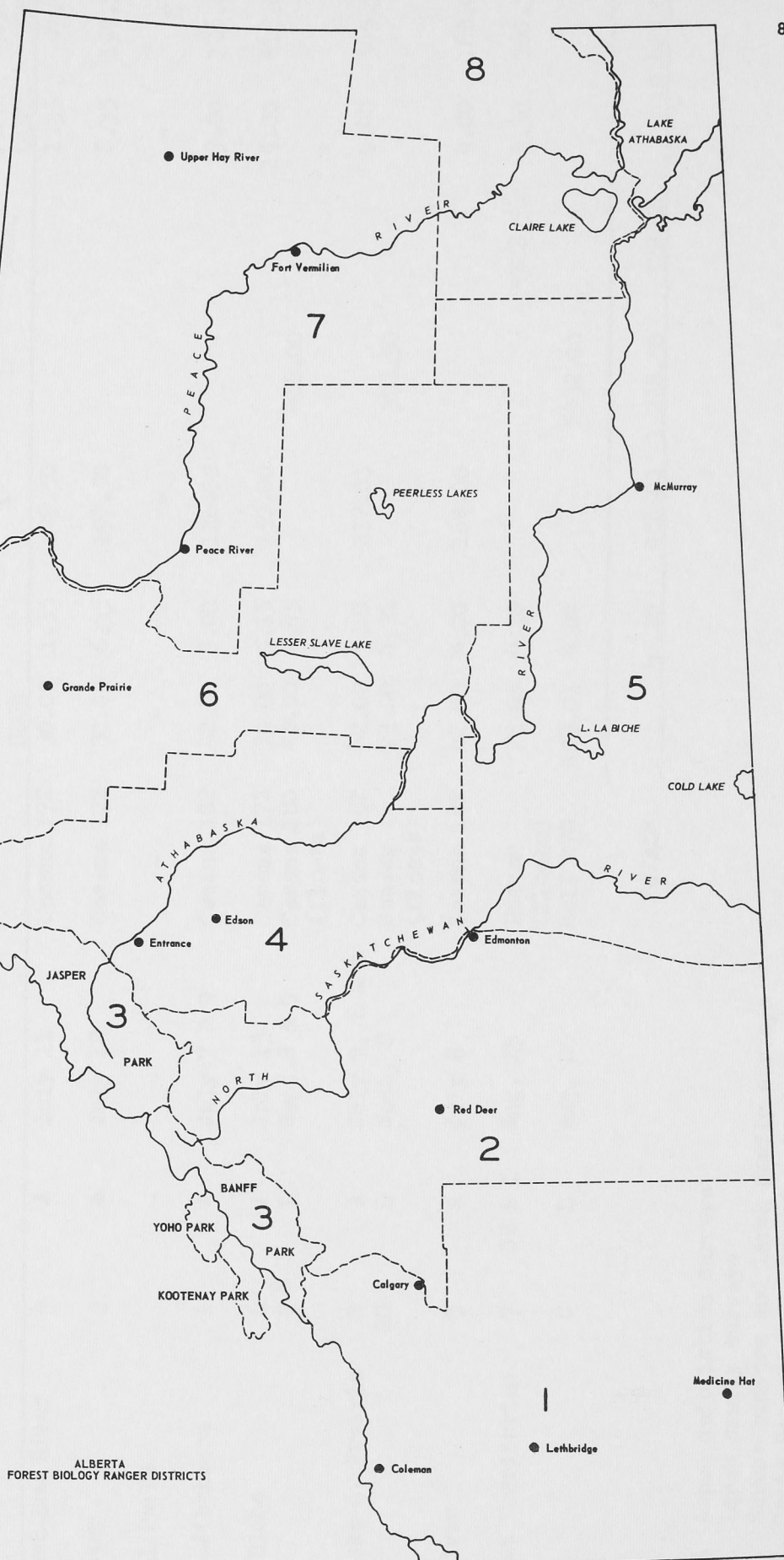
A high incidence of spruce cone rust caused by Chrysomyxa pirolata Wint., was evident in the Rocky Mountain House area.

The known distribution of Atropellis canker of pine caused by Atropellis piniphila (Weir) Lohman and Cash, was extended with a number of new records including 2 records of its occurrence on lodgepole pine - jack pine hybrids.

Two new areas of heavy infection were found north of Nordegg and south of Rocky Mountain House.

ACKNOWLEDGEMENTS

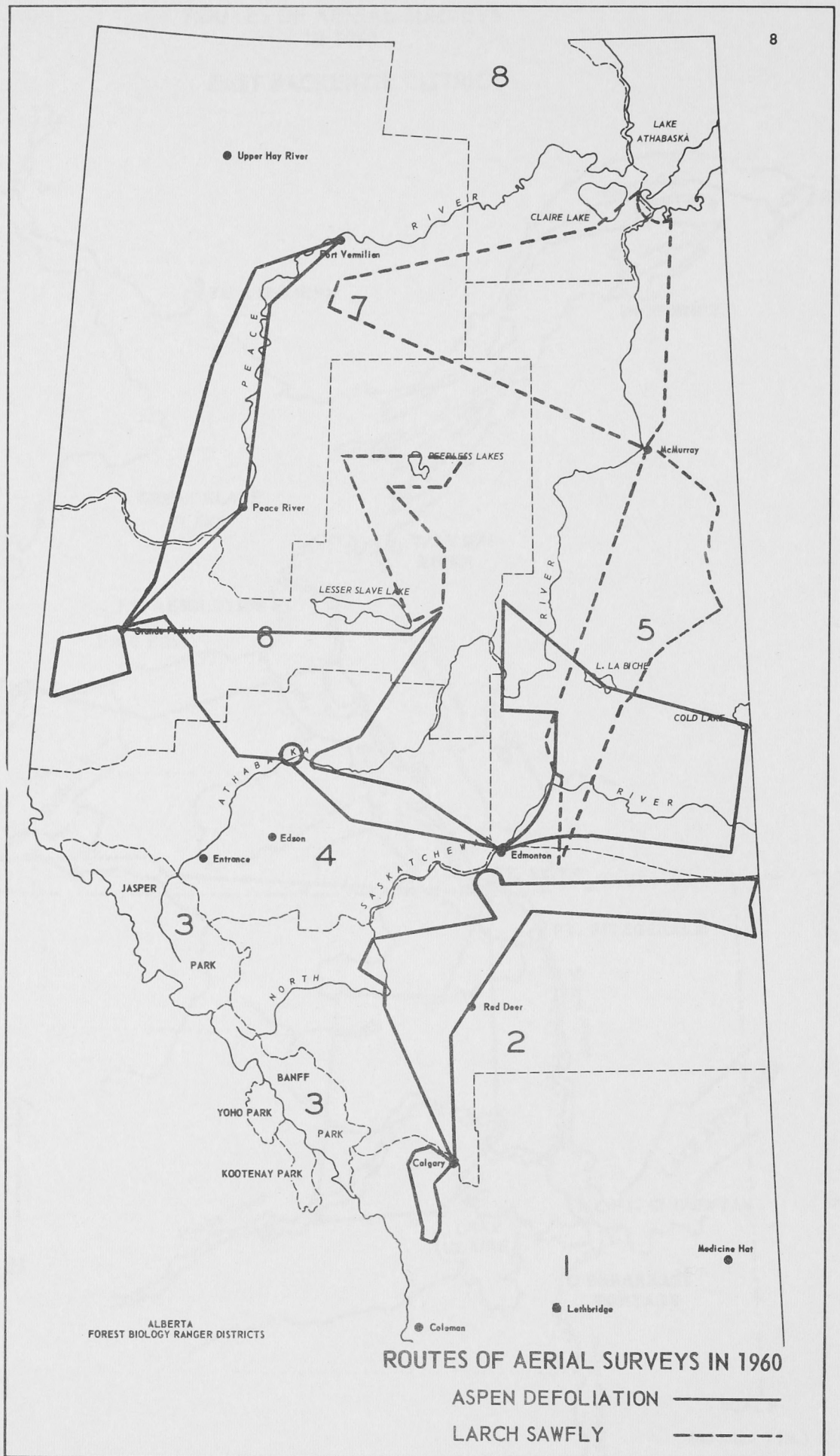
The work of the Forest Insect and Disease survey was greatly facilitated by the help and co-operation tendered by personnel of the Alberta Forest Service, the Provincial Agricultural Extension Service and the Department of Northern Affairs and Natural Resources.



SUMMARY OF AERIAL SURVEYS

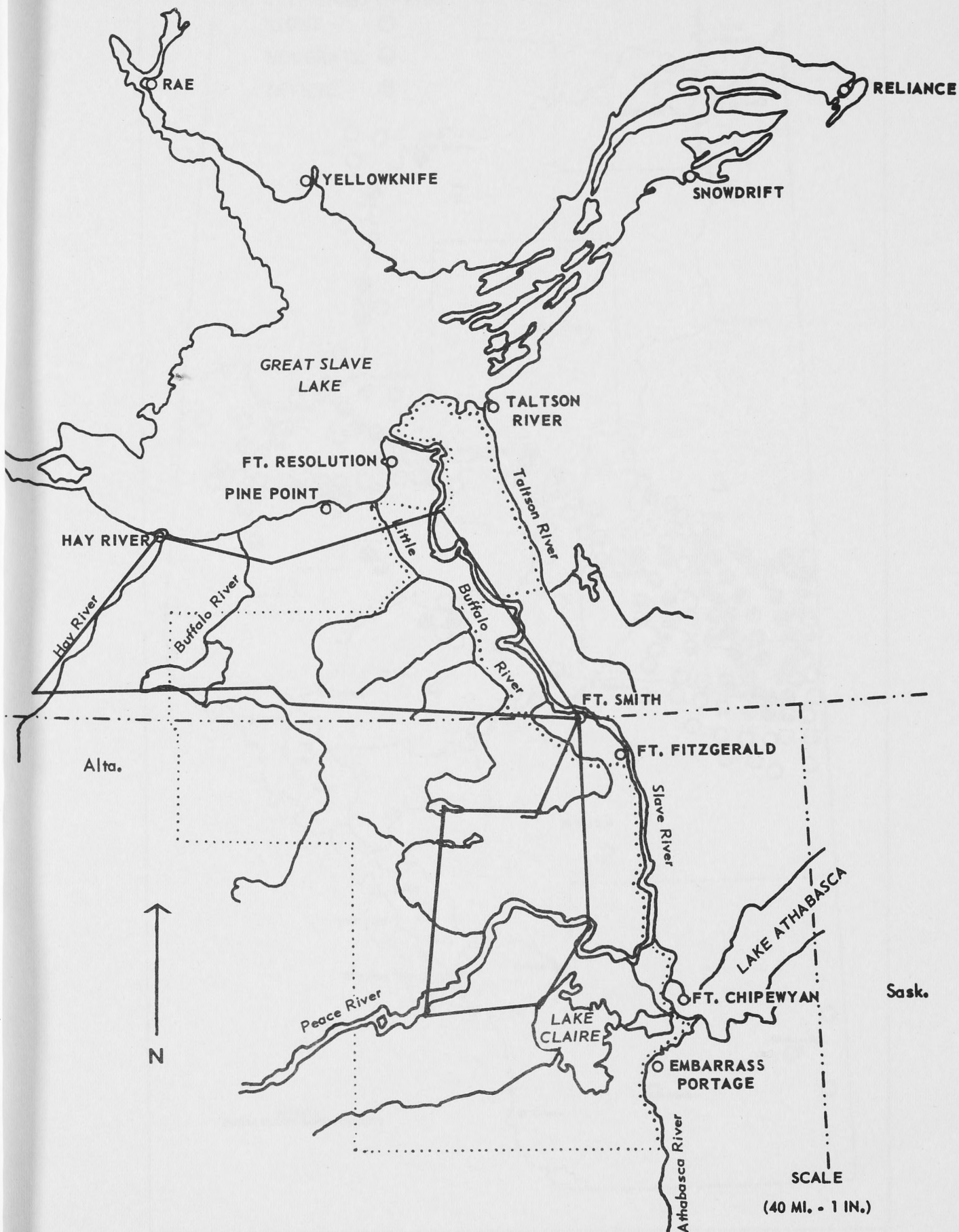
DISTRICT	FLT. NO.	PURPOSE	DATE	AIRCRAFT	COST PER HOUR	HOURS	COST		HOURS PER DIST.	COST PER DIST.
							A	L		
Crowsnest-Bow River	4	A	July 11	Cessna 172	30.00	1.35	47.50		1.35	47.50
Clearwater	5	A	July 12	Cessna 172	30.00	6.35	197.50		6.35	197.50
National Parks		-	-	-	-	-	-		-	-
Brazeau-Athabasca	1	A	July 7 & 9	Cessna 182	42.00	3.00	126.00		3.00	126.00
Lac la Biche	6 9	A L	July 13 Sept. 8 & 9	Cessna 172 Cessna 180 (floats)	30.00 48.00	5.15 9.45	150.00	468.00	15.00	618.00
Slave Lake-G. Prairie	2 10	A L	July 7, 8 & 9 Sept. 8	Cessna 182 Beaver (floats)	42.00 73.00	5.10 4.30	217.00	328.50	9.40	545.50
Peace River	3	A	July 8	Cessna 182	42.00	4.00	168.00		4.00	168.00
Northwest Territories	7	SB & L	Aug. 25	Beaver (floats)	73.00	4.30			8.30	760.50
	8	L	Aug. 26	Bell 47G	108.00	4.00		*432.00		
TOTALS						48.20	906.00	1,228.50	328.50	2,463.00

A Aspen defoliation surveys
 L Larch sawfly surveys
 SB & L Spruce budworm and larch sawfly surveys
 * Costs borne by the Department of Northern Affairs and National Resources



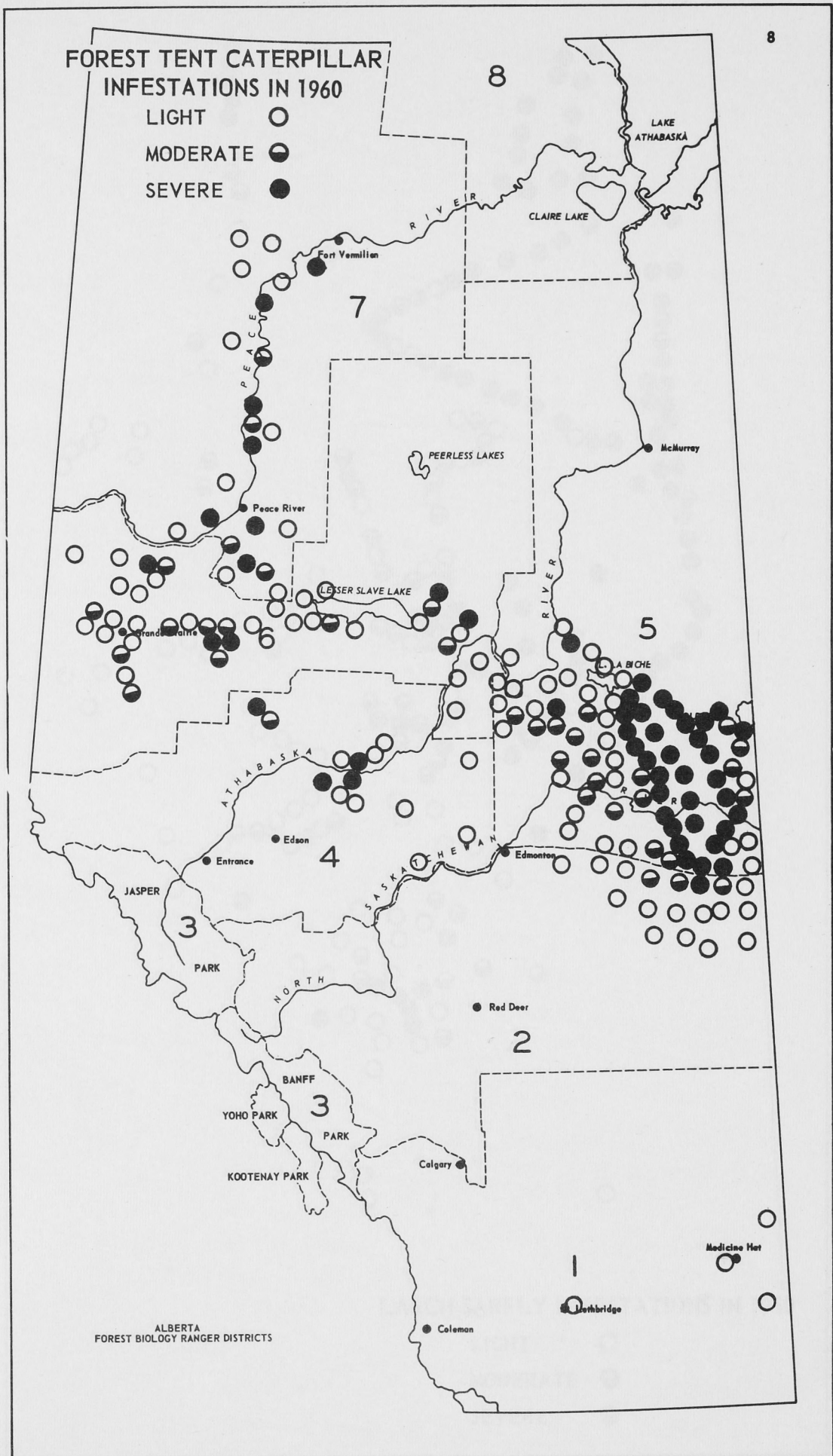
ROUTES OF AERIAL SURVEYS
IN 1960

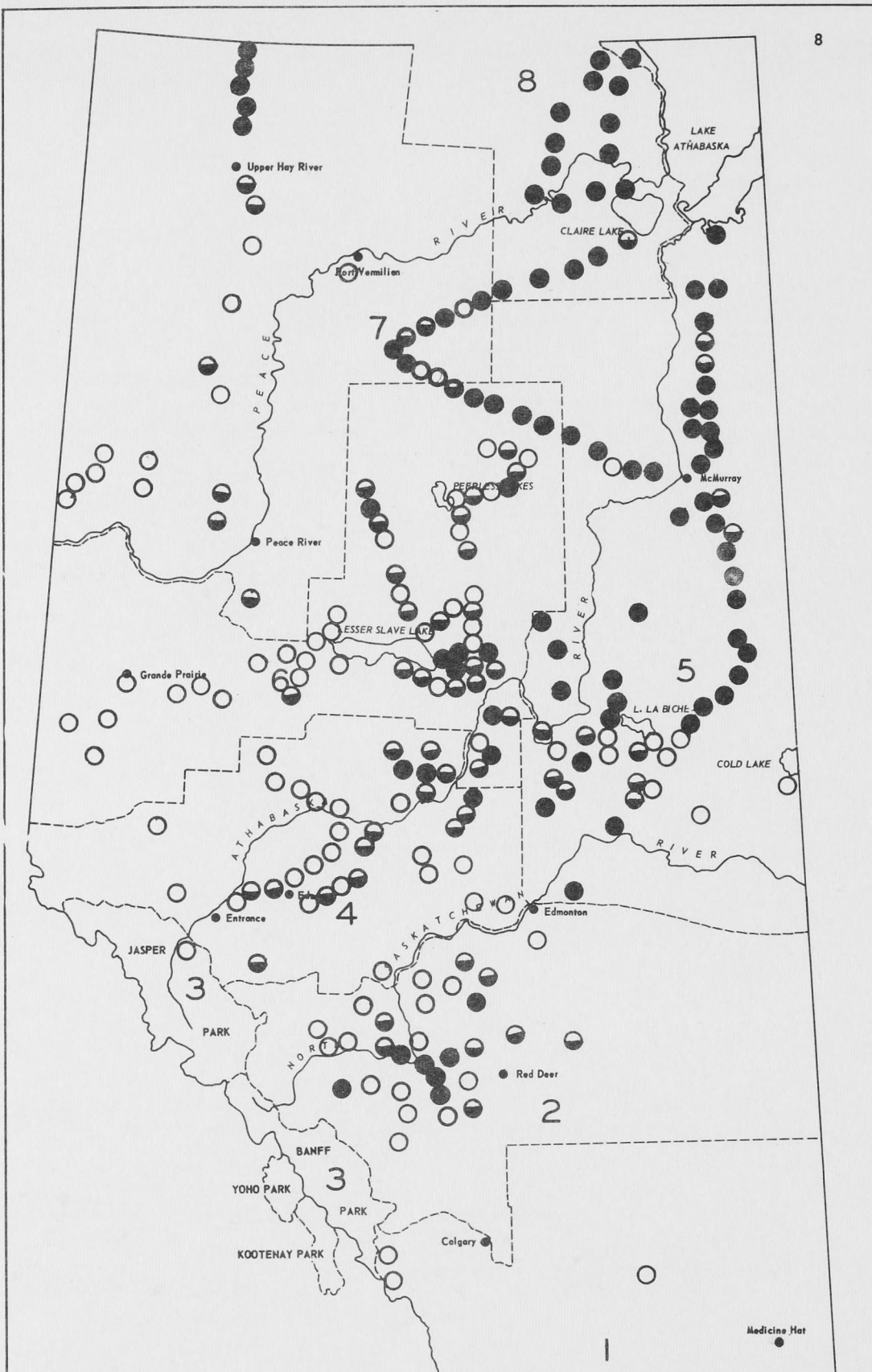
EAST MACKENZIE DISTRICT



FOREST TENT CATERPILLAR INFESTATIONS IN 1960

- LIGHT ○
- MODERATE ◐
- SEVERE ●





ALBERTA
FOREST BIOLOGY RANGER DISTRICTS

LARCH SAWFLY INFESTATIONS IN 1960

- LIGHT ○
- MODERATE ◐
- SEVERE ●

A

Forest tent caterpillar egg-bands collected at Elk Point in August.

by N. W. Wilkinson.

B

Forest tent caterpillar larvae on trunk of aspen near Beauvallon in June.

by N. W. Wilkinson.

C

Defoliation of aspen by forest tent caterpillar. Taken near Wanham in June.

by J. Emond.

D

Ugly nest caterpillar tent. Taken at Sootford in July.

by N. W. Wilkinson.



E

Leaf Beetles, Altica plecipennis
on willow. Taken near Medicine
Hat in May.

by J. Petty.

F

"Broomed" crown of white
spruce infested with
Deoryctria sp. near
Enterprise, N. W. T.

by G. J. Smith.

G

Defoliation of white spruce by
spruce budworm. Taken on Long
Island in the Slave River in
August.

by G. J. Smith.

H

Nest of Pamphiliidae on
Lodgepole pine. Taken in
Cypress Hills in June.

by J. Petty.



FOREST BIOLOGY RANGER REPORT
CROWSNEST -- BOW RIVER DISTRICT
ALBERTA 1960

by
J. A. WATSON
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1961

INTRODUCTION

The 1960 field season for the Crowsnest - Bow River District commenced May 15 and terminated October 1. Road conditions during this period were generally good, due to the dry, hot weather experienced throughout most of the summer; 11,743 miles were travelled by truck and 140 miles by aircraft in District field work.

Prior to the commencement of the field season, 3 weeks were spent at Seebe fibreglassing the Government cabin cruiser "Borealis" in preparation for its annual trip on the MacKenzie River.

Two weeks were spent at the Mt. Eisenhower Research Station assisting with the summer and fall lodgepole needle miner sampling and larvae count. Assistance was also given in sequential sampling for the lodgepole needle miner in the National Parks District.

Phenology plot measurements using lodgepole pine shoot growth as an aid to determine the seasonal timing of insect sampling in the field were made at the 4 established locations. Data and spruce seed collections for the Dominion Forest Service were made at 5 plots in the District.

There were no new insect outbreaks recorded and those previously reported were inspected. Fall cankerworm on Manitoba maple in the agricultural shelterbelt areas was again prevalent and in some cases damage was severe. One of the most serious aspen defoliators in 1959, the bruce spanworm, was conspicuous by its near absence this year.

Two new outbreaks of dwarf mistletoe on lodgepole pine were recorded. The collection of data on 3 disease outbreaks was discontinued and other outbreaks re-examined showed little change in intensity or area.

At the conclusion of the field season, one week was spent helping with the construction of a new ranger headquarter cabin in Grande Prairie.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Insect		Disease		Deciduous Hosts	Insect		Disease	
	Colls.	Repts.	Colls.	Repts.		Colls.	Repts.	Colls.	Repts.
Spruce	25	4	4	0	T. aspen	31	24	4	0
Pine	28	3	14	0	M. maple	7	39	0	0
Blue Douglas fir	5	2	3	0	Poplar	17	4	1	0
Alpine fir	1	1	0	0	Willow	15	2	0	0
Larch	1	3	0	0	Alder	4	1	0	0
					Birch	4	1	0	0
	—	—	—	—		—	—	—	—
Totals	60	13	21	0		78	71	5	0
Collections from Miscellaneous Hosts									29

Grand Total

277

INSECT CONDITIONS

Poplar borer, Saperda calcarata Say.

Found in 3 localities of the District, this borer was responsible for severe damage resulting in death to some aspen trees which had become infected. Copious, weathered sap flow gave some of the living brood trees a messy tarred appearance. Aspen stands in Waterton Lakes National Park were hit by light to medium populations of poplar borers which showed preference for trees with a 4 to 5 inch D.B.H. At the entrance to the Waterton Golf Club, a high population was found on the margin of a small aspen grove causing severe damage to many trees. This infestation gradually reduced in intensity towards the centre of the grove where only occasional strikes were observed. In the vicinity of the Waterton Riding Academy a moderate infestation was evident. At the Kananaskis Ranger Station a high population was found in three quarters of an acre of aspen, some trees having as many as 20 strikes. Seven miles south of the Kananaskis Ranger Station in a quarter acre stand 10 dead trees were found. These trees had been heavily attacked by poplar borers. Two miles west of Canmore a high population was found but the area was less than one quarter acre in extent.

American aspen beetle, Gonioctena americana Schffr.

Collections and reports of this insect showed it to be the most widespread and destructive of the aspen defoliators in District 1. On the Coleman - Kananaskis Trunk Road, low populations were found generally along the entire way. At the Dutch Creek Camp Ground, several trees 3 to 4 feet high were completely defoliated. At Beaver Mines and Burmis defoliation was light with some severe damage occurring one mile south of Beaver Mines. In Waterton Lakes National Park populations were low and were found wherever aspen occurred. Aspen in the foothills near Millarville, Bragg Creek, and Turner Valley supported low populations with moderate damage being done to a small clump of trees at Priddis. From Longview to the Highwood Ranger Station all aspen examined had low populations.

Other aspen defoliators

Aspen stands along the eastern slopes in Waterton Lakes National Park and in the Porcupine and Cypress Hills supported low populations of the poplar leaf miner, Phyllocnistis populiella Chamb. Very little damage was caused by this insect. A leaf tier, Pseudexentra improbana oregonana Wlshm. was responsible for moderate damage to aspen at Hanna, Sunnybrook, Buffalo and Gem, and was found for the first time on plains cottonwood, 2 miles west of Cavendish. Populations of Bruce spanworm, Operophtera bruceata (Hlst.), were very low in 1960. In many of the areas that in past years had sustained heavy injury, populations were either very low or non existent.

Fall cankerworm, Alsophila pometaria (Harr.)

• Surveys of Manitoba maple shelterbelts in the agricultural area took place in the early spring. East of Drumheller to the Saskatchewan Border, along Highway 9, this insect was found intermittently and caused light defoliation. This trend continued south of Sibbald, through Acadia Valley and across the Red Deer River to Bindloss. West of Bindloss, through the Cavendish - Jenner - Duchess area, damage was also light. At Rosemary, Countess and Gem and through the Handhills to Hanna, populations were scattered and in some shelterbelts in this area no defoliation was evident. South of the Old Man and South Saskatchewan rivers, from Lethbridge to Medicine Hat, damage ranged from light to moderate in the shelterbelts checked, with the highest populations tending southeastward.

Spruce budworm, Choristoneura fumiferana (Clem.)

This insect was again responsible for damage to spruce stands in the Cypress Hills Provincial Park. The heaviest damage was found in the valley bottoms. In an area approximately one mile west of the confluence of Grayburn and Battle Creeks, defoliation was moderate and in a few isolated locations, severe. The damaged area extended west for approximately one half mile, becoming progressively lighter. For 3 miles south of Battle Creek along the Saskatchewan border damage was moderate. Within this area the overall defoliation tended to be patchy rather than continuous.

Engelmann spruce weevil, Pissodes engelmanni Hopk.

There were no outbreaks of this weevil reported in the District. However, at several locations serious terminal shoot damage was sustained by open growing spruce in sapling stands. Six miles west of Waterton townsite on the Cameron Lakes Road, a light infestation was found in a one half acre stand. Many dead tips were seen and those trees just newly attacked were starting to curl and the colour of the foliage was fading. Light, very scattered attacks were reported from the Bragg Creek, Hillcrest and Coleman areas and in the Porcupine Hills.

<i>Enallagma cyathigerum</i> (L.)	2	K. maple	Found collected between Teton and Medicine Mt.
Pine rock collar weevil, <i>Elaphinus</i> sp.	2	Lp. pine	Found in Cypress Hills.
Bark beetles, Lp. sp.	7	Spruce Lp. pine	Damage to wind thrown trees at Spry Lake.
Forest tent caterpillar, <i>Malacosoma disstria</i> Hb.	4	Willow T. aspen Choke-cherry S. ash	Low populations at Medicine Mt., Lethbridge, Schuler.
Box elder aphid, <i>Paratetraneura aceris</i> (Thos.)	17	K. maple	Common in agriculture shelterbelts.
Pitch weevil weevil, <i>Elaphinus</i> sp.	3	Lp. pine	Low populations in most pine stands.
Pine needle scale, <i>Aspidiotus conicularis</i> (Gibbs)	4	Lp. pine	Light infestations at Coleman, Hillcrest and Elbow.
Twig beetles, <i>Enallagma</i> sp.	2	Spruce	Found on Mountain Park Road, Schuler. Elbow.
Larch sawfly, <i>Pristiphora erichsonii</i> (Rtg.)	3	W. larch	Found at Soda, Banff and Brooks.

TABLE II

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE CROWNEST - BOW RIVER DISTRICT 1960).

Insect Species	Number of collections	Host	Remarks
Ugly nest caterpillars, <u>Archips cerasivorana</u> (Fitch)	5	Chokecherry	Moderate populations W.L.N.P.
Lodgepole needle miner, <u>Evagora</u> sp.	1	Lp. pine	Light in Cypress Hills.
Cecropia moth, <u>Hyalophora cecropia</u> (L.)	2	M. maple	Pupae collected be- tween Tabor and Medicine Hat.
Pine root collar weevil, <u>Hyllobius</u> sp.	2	Lp. pine	Found in Cypress Hills.
Bark beetles, <u>Ips</u> sp.	7	Spruce Lp. pine	Damage to wind thrown trees at Spray Lakes.
Forest tent caterpillar, <u>Malacosoma disstria</u> Hbn.	4	Willow T. aspen Chokecherry G. ash	Low populations at Medicine Hat, Lethbridge, Schuler.
Box elder aphid, <u>Periphyllus negundinis</u> (Thos.)	17	M. maple	Common in agriculture shelterbelts.
Pitch nodule maker, <u>Petrova</u> sp.	3	Lp. pine	Low populations in most pine stands.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	4	Lp. pine	Light infestations at Coleman, Hillcrest and Elkwater.
Twig beetles, <u>Pityophthorus</u> sp.	2	Spruce	Found on Kananaskis Trunk Road. Resembles <u>Pissodes</u> damage.
Larch sawfly, <u>Pristiphora ericksonii</u> (Htg.)	3	W. larch	Found at Seebe, Kananaskis Lakes and Brooks.

TABLE III

SUMMARY OF RECORDED DISEASE OUTBREAKS

ACTIVE IN THE CROWSNEST-BOW RIVER DISTRICT IN 1960.

break ber	Location	Causal Organism	Remarks
1	Castle Ranger Station	<u>Atropellis piniphila</u> (Weir) Lohman and Cash	10 per cent of trees infected.
2	2 miles south K.F.E.S.	<u>Atropellis piniphila</u> (Weir) Lohman and Cash	Outbreak patchy.
4	4 miles south K.F.E.S.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Dwarf mistletoe on Lp. pine.
7	Mt. Crandell, W.L.N.P.	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	25 per cent trees affected by shoe- string rot.
8	Dutch Creek Road	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	10 per cent trees affected.
9	Dutch Creek area	<u>Hypodermella montivaga</u> (Petrak) Dearn.	Needle cast heavy.
10	Sofa Mtn. W.L.N.P.	<u>Cronartium ribicola</u> Fischer	100 per cent of trees affected.
11	Sofa Mtn. W.L.N.P.	Red Belt	No change from 1959 report.
12	13 miles north Coleman	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	No change from 1959 report.
13	Grayburn Creek	<u>Peridermium harknessii</u> Moore	No change from 1959 report.
14	Lynx Creek Valley	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	New outbreak, 4 to 6 square miles heavily infected.
15	Elkwater	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	New outbreak recorded 1960.

DISEASE CONDITIONS

Spruce cone rust, Chrysomyxa pirolata Wint.

This cone rust was noted in 3 locations where cones were collected for the Federal Forestry Branch. One tree was felled and the cone crop examined at each of the following locations: Cameron Lake, Vicary Creek and Coat Creek. Light infections were found in each case.

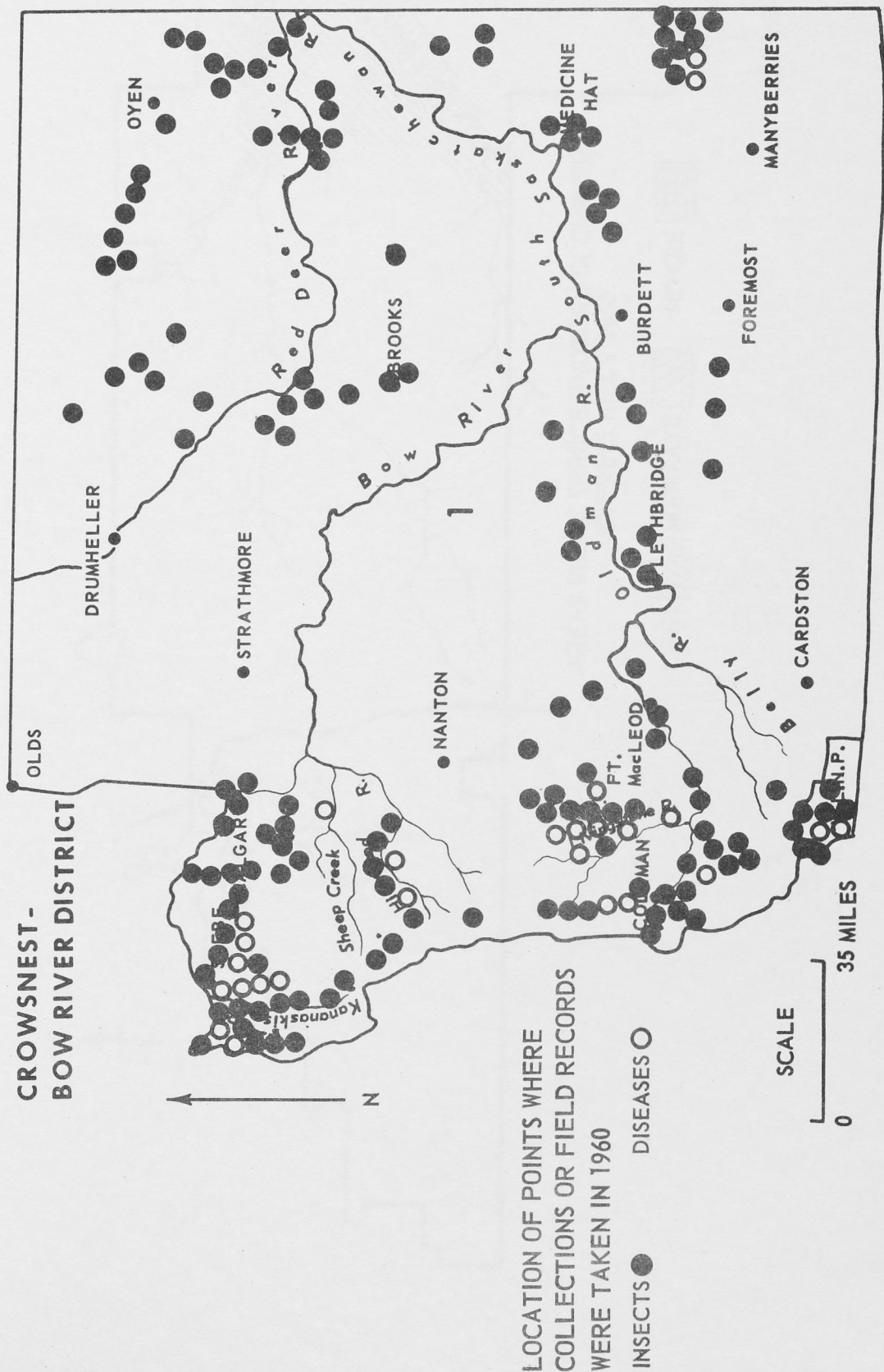
Four species of Cronartium rust were found in the District in 1960. Cronartium ribicola Fischer, on whitebark pine persisted near the headwaters of York Creek. This area however, was to be clearcut in the summer and fall of 1960. Limber pine along the Red Rock Canyon Road, Waterton Lakes National Park, were inspected and light infections were found. Single collections of Cronartium comandrae PK. on the stems of lodgepole pine were taken at Seebe and at the Cat Creek camp grounds on the Kananaskis Trunk Road. Squirrels had eaten the bark containing some of the fruiting bodies and in one case had nearly girdled the tree.

Peridermium harknessii Moore was commonly found in the lodgepole pine stands of the Cypress Hills, causing club-like malformations on the branches. This rust was also found in the Porcupine Hills and south of Hillcrest. Peridermium stalactiforme A. & K. was found at Spray Lakes on lodgepole pine and at the Highwood Ranger Station on limber pine and in each instance damage was light.

TABLE IV
SUMMARY OF DISEASE COLLECTIONS

Pathological Agent	Host	Location	Remarks
<u>Phothobium americanum</u> C. ex Engelm.	Lp. pine	Elkwater Canmore	Mistletoe infection. Extensive.
<u>Dothiorella piniphila</u> (ir) Lohman and Cash	Lp. pine	Jumping Pound	Stem canker. Light damage.
<u>Uromyces pirolata</u> C.	E. spruce	Coleman	Cone rust common here.
<u>Dothiorella comandrae</u>	Lp. pine	Cat Creek Camp Grounds Seebe	Stem rust, not extensive.
<u>Dothiorella ribicola</u> cher	Limber pine	Red Rock Canyon	No outbreak here. Damage light.
<u>Dothiorella deformans</u> (ir) Darker	Lp. pine	Jumping Pound	Needle cast. Light infection.
<u>Dothiorella igniarius</u> (ex Fr.) Kickx	T. aspen	Millarville	Several conks on one tree. Rot penetrated to heartwood.
<u>Dothiorella officinalis</u> (ll. ex Fr.) Faull	D. fir	Cowley	Causes decay in stand- ing Douglas Fir. Only one canker found.
<u>Dothiorella pinicola</u> (ex Fr.) Cke.	E. spruce	Coleman	Fruiting on dead trees.
<u>Dothiorella</u> sp.	Lp. pine	Jumping Pound	Needle cast. Light infection.
<u>Dothiorella albertensis</u> h.	T. aspen	Seebe	Leaf rust spots. Light infection.
<u>Dothiorella occidentalis</u> ks	B. poplar	Cowley	Leaf rust, moderate infection.
<u>Dothiorella coloradense</u> (let.) A. & K.	E. spruce	Seebe	Needle rust.
<u>Dothiorella harknessii</u> ore	Lp. pine	Elkwater Cowley Hillcrest	Gall producing rust. Light damage.
<u>Dothiorella stalactiforme</u> & K.	Limber pine Lp. pine	Highwood Ranger Station Spray Lakes	Found on one very old tree. One stem canker found.

CROWSNEST- BOW RIVER DISTRICT

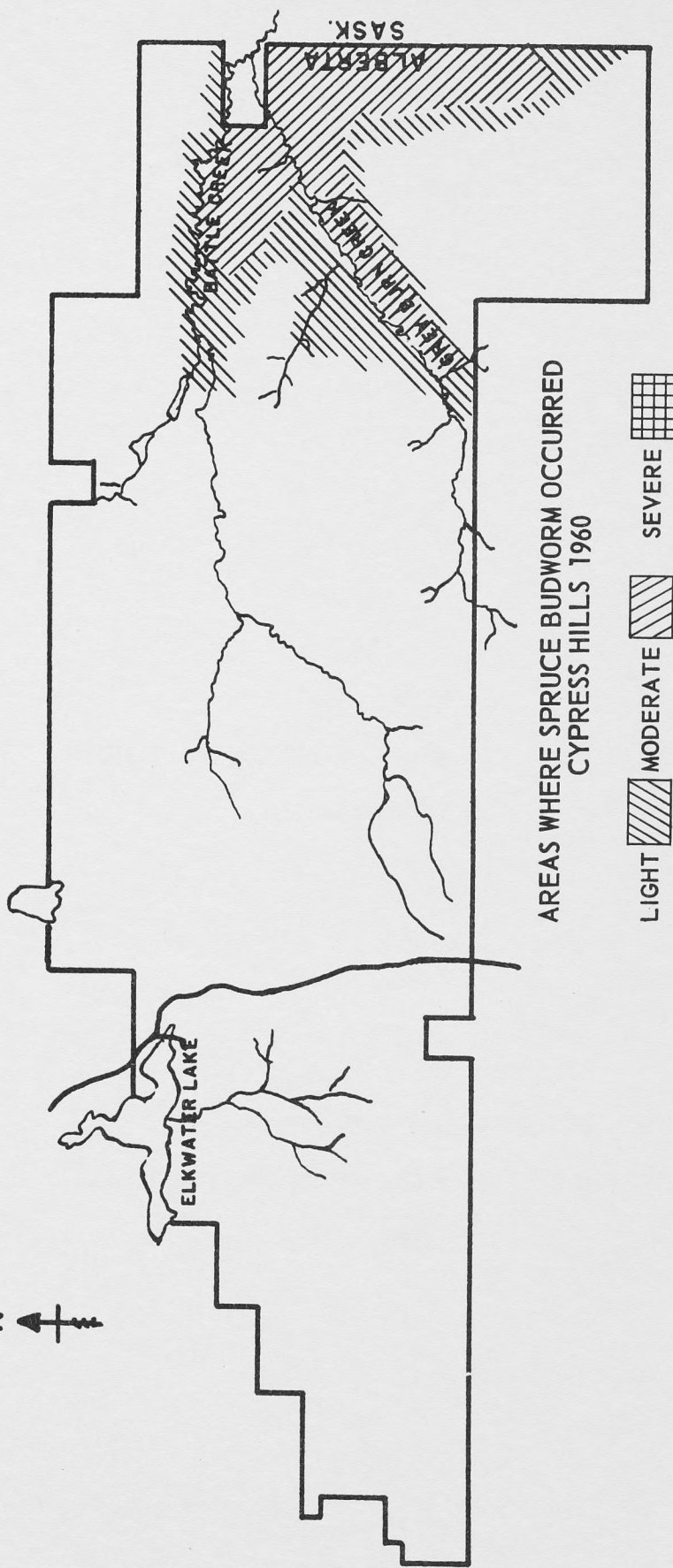


LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1960

INSECTS ● DISEASES ○

SCALE
0 35 MILES

ELKWATER PROVINCIAL PARK



SCALE 1" = 2 mi.

FOREST BIOLOGY RANGER REPORT

CLEARWATER DISTRICT

ALBERTA 1960

by

P. F. LARUE

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1961

INTRODUCTION

The objective of this report is to give the status of forest insects and diseases as found in Forest Biology Ranger District 2 during the 1960 field season. General field work commenced June 1 and terminated September 30. A total of 13,842 miles were travelled by truck on survey and special projects and 712 miles were covered by air on a survey to determine the extent and degree of aspen defoliation. Weather conditions during this period were generally warm with moderate precipitation in June and the latter part of September. The dry weather throughout most of the summer enabled a better coverage of the more inaccessible areas of the District.

Prior to the field season, from May 2 until May 28, the time was spent on general improvements at the Crimson Lake cabin. At the conclusion of the field season, 2 weeks were spent with G. Stevenson of the Forest Pathology Laboratory on a survey of mistletoe on pine in the southern half of the Province. One week was used during the latter part of October in sequential sampling for forest tent caterpillar egg mass s in the northeast part of the District.

Data were again collected from the seed plots established by the Federal Forestry Branch, and from the phenology plots established the previous year by the Forest Biology Ranger in the District. Accompanied by J. Baranyay, approximately one week was spent examining outbreaks of the pine mistletoe, and checking outbreak reports.

Surveys in the agricultural section of the District showed a reduction in the populations of the yellow-headed spruce sawfly. Damage to ornamental and shelterbelt spruce trees caused by the spider mite also showed a slight reduction. Infestations of the Bruce spanworm and the leaf-tier, Pseudexochus ferrugineus oregonus Wlsh., subsided during the 1960 season. An increase in the numbers of the larch sawfly was evident west of Rocky Mountain House.

At the request of Dr. Nighswander, branch and stem rusts were collected from lodgepole pine north of Reddy Mountain House. An outbreak of the stem canker, Atropellis piniphila (Weir) Lohman & Cash, was reported 5 miles east and 13 miles north of Nordegg. Outbreaks of mistletoe on lodgepole pine were investigated west of Water Valley and east of the Red Deer Ranger Station.

TABLE I

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Iniferous Hosts	Insect		Disease		Deficient Hosts	Insect		Disease	
	Colls.	Repts.	Colls.	Repts.		Colls.	Repts.	Colls.	Repts.
pruce	71	7	3	0	T. aspen	54	38	0	0
ine	32	12	1	0	WILLOW	6	0	0	0
arch	15	0	0	0	Alder	7	0	0	0
ir	5	0	0	0	Birch	3	0	0	0
					Rose	4	0	0	0
					Aspen	3	0	0	0
	—	—				—	—	—	—
otals	123	19	4	0		80	38	0	0
ollections from Miscellaneous Hosts									3
						Grand Total			264

INSECT CONDITIONS

Larch sawfly, Pristiphora ericksonii (Htg.)

Populations of this sawfly on larch increased and were more widely distributed in 1960. The heaviest defoliation was again centred in the Rocky Mountain House - Sylvan Lake area south to the limits of larch near Sundre. West of this area to Nordegg, populations had increased considerably. Moderate defoliation was recorded for 12 miles west of Rocky Mountain House. From this point to the western limits of larch near Nordegg, the amount of defoliation became progressively lighter.

In the vicinity of the larch plot 18 miles south of the Clearwater Ranger Station, severe defoliation was again found. In the Winfield-Buck Lake regions and north of Stettler near Red Willow, patches of moderate to severe defoliation were recorded. Over the remainder of the District, light defoliation was evident in all stands visited.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station Number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960
2-1	Yoeford	Moderate	Light	Light
2-2	Rocky Mtn. House	Light	Severe	Severe
2-3	Nordegg	Light	Light	Moderate
2-4	Clearwater	Moderate	Moderate	Severe
2-5	Caroline	Light	Moderate	Light
5-3	Millet	Moderate	Light	Light

Bruce spanworm, Operophtera bruceata (Hlst.)

Noteworthy changes in the population levels of this Geometridae were observed throughout the aspen stands in the District. In the agricultural areas from the southern boundary of the District to Highway 13, populations fell almost exclusively in the light category, with the exception of a strip from Halkirk east to Coronation where moderate populations were recorded. Highest numbers of larvae were observed in a block encompassed by Camrose, Tofield, Wainwright, and Hardisty. Populations in this area were generally medium with small patches of heavy defoliation. North of this block to Highway 16, populations were classed as low, with the exception of small areas in the Vermilion region where medium to high populations were recorded.

Low populations were present in the forested part of the District from the Bow River to Rocky Mountain House. North of this to the boundary of the District, only scattered larvae were present.

American aspen beetle, Gonioctena americana (Schaeff.)

Low populations of the American aspen beetle were taken in widely separated areas in the farming district. The only region where this beetle was observed causing noticeable damage was east of Olds. In the forested areas, a small infestation persisted at Horburg and west for 6 miles. Over the remainder of the District only light defoliation was observed.

Aspen leaf-tiers, Pseudexentera improbana oregonana Wlshm., Choristoneura conflictana (Wlk.)

There was a noticeable decline in the populations of these leaf rollers from 1959. The majority of curled and discolored aspen leaves were attributed to P. improbana oregonana. Larvae of the large aspen tortrix were again associated with this insect along with the American aspen beetle and the Bruce spanworm. Since these 4 species were found in conjunction with the Bruce spanworm it was difficult to determine the amount of damage the individual species were responsible for.

Although the leaf tier P. improbana oregonana was present in all aspen stands examined, populations in the southern region of the farming district were found to be in the low category with the exception of patches of moderate defoliation in the Castor and Big Valley areas. This condition persisted north to Highway 13 from Wetaskiwin to the Saskatchewan border. From this line north to the boundary of the District on Highway 16, populations were found generally in the moderate classification with higher populations recorded in the Vermilion and Vegreville region.

The most noticeable decrease in the population of this insect was recorded in the forested part of the District. Only light defoliation was observed anywhere west of Highway 2.

Larvae of the large aspen tortrix were collected in low numbers in the northern half of the agricultural district. There was little change in the distribution of this leaf-tier from the 1959 season.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

The outbreak of this sawfly on ornamental and shelterbelt spruce trees subsided further during the 1960 season. Low populations were found in most shelterbelts examined, with very light defoliation observed. There appeared to be a general increase in the population trend of this insect throughout the forested areas, but defoliation was negligible.

Spruce spider mite, Olygonychus ununguis (Jac.)

Damage caused by this spider mite was again evident in most of the ornamental and shelterbelt spruce visited. The 1960 examination showed little change in the population levels from the previous year. Discoloration and webbing of needles was again observed in the Stettler and Camrose areas. In the forested regions populations were again found to be low with little evidence of damage.

Forest tent caterpillar, Malacosoma disstria Hbn.

Larvae of this tent caterpillar were collected over a greater area than in 1959. The southern range of this insect species appeared to be along Highway 13 between Camrose and the Saskatchewan border where light populations occurred. This condition existed north to Highway 16 except in an area from Ranfurly to a point 5 miles east of Vermilion where medium to high populations were present.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1960	Actual Defoliation 1960	Predicted Defoliation 1961
Phillips	Not noticeable	Light	Not noticeable
Lougheed	Not noticeable	Light	Not noticeable
Hughenden	Not noticeable	Light	Not noticeable
Ribstone	Not noticeable	Light	Not noticeable
Rivercourse	Not noticeable	Light	Not noticeable
Provost	Not noticeable	Light	Not noticeable
Vermilion	Noticeable	Moderate	Noticeable
Lavoy*	---	---	Not noticeable
Edgerton*	---	---	Not noticeable
Fabyan*	---	---	Not noticeable
Mundare*	---	---	Not noticeable

* Established 1960.

Poplar leaf miner, Phyllocnistis populiella Cham.

Characteristic mining of aspen leaves by this miner was quite noticeable in most of the forested areas visited during the field season. Although not in the outbreak category, there was a noticeable increase in populations over 1959. Low populations could be found in most of the aspen groves examined in the farming regions of the District.

Prairie tent caterpillar, Malacosoma lutescens (N. & D.)

Tents of this caterpillar on rose and saskatoon increased in numbers over the previous year in the northern part of the agricultural area. Tents were most commonly found in the Wainwright and Coronation regions and in the vicinity of Compeer along the Alberta-Saskatchewan boundary. High populations were recorded 7 miles south of Rosalind, along the valley of the Battle River and at Wetiskow. On the southern extremity of the farming areas of the District, tents were numerous in the Red Deer River valley near the Tolman Ferry east of Trochu. Over the remainder of the agricultural area scattered infestations of this insect were observed.

Spruce budworm Choristoneura fumiferana (Clem.)

An outbreak of this budworm was present throughout the logging berth of the Edwards Lumber Company, southwest of Nordegg. This infestation occurred on the south side of the Saskatchewan River adjoining the Banff National Park boundary and extended east approximately 5 miles. Heaviest defoliation appeared on the sub-alpine fir understory with light damage occurring to white spruce. This outbreak area appeared to be a continuation of the infestation that has persisted in the Banff National Park for a number of years.

Light damage to sub-alpine fir and white spruce regeneration was observed 13 miles up the Atlas Haul Road 5 miles east of Nordegg. Due to the lateness of the season when this outbreak was discovered, no larvae were present.

Adelges sp.

There was a noticeable increase in the number of spruce tips infested by this gall-making insect throughout the forested areas of District 2. High populations were recorded from Cochrane north to Rocky Mountain House along the East Slopes Road, along the road from Cochrane to Caroline, and in the Buck Lake and Alder Flats districts.

TABLE IV
OTHER NOTEWORTHY INSECTS
WHICH OCCURRED IN THE CLEARWATER DISTRICT, 1960)

Insect species	Number of collections	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	7	W. spruce	Low populations in southern portion of forested area.
A sawfly, <u>Anaplonyx</u> sp.	7	Larch	Low populations found in all larch stands.
Grey pine looper, <u>Caripeta angustiorata</u> Wlk.	26	Lp. pine	Common on pine in fall throughout District.
Green striped looper, <u>Feralia jocosa</u> Gn.	9	W. spruce	Low numbers found in scattered locations.
Grey willow leaf beetle, <u>Gallerucella decora</u> Say.	6	T. aspen	Caused light to moderate discoloration to aspen in northern part of agricultural area.
Spotted tussock moth, <u>Halisidota maculata</u> Harr.	4	Willow Alder	Numerous from Rocky Mountain House north to Alder Flats.
Pine root collar weevil, <u>Hylobius</u> sp.	5	Lp. pine	Larvae and galleries present in most Lp. pine.

ther noteworthy insects.....continued

Insect species	Number of Collections	Host	Remarks
Looper, <u>Stenoloricaria</u> Evers.	31	T. aspen	Found commonly in low numbers in conjunction with other aspen defoliators.
Balsam fir sawfly, <u>Neodiprion abietis</u> (Harr.)	17	W. spruce	Fairly common throughout forested area. Not feeding gregariously.
Sawfly, <u>Neodiprion</u> sp.	13	Lp. pine	Common throughout Clearwater Forest District.
Pitch nodule maker, <u>Petrova</u> sp.	6	Lp. pine	Found in endemic numbers in forested areas on young pine causing very light damage.
Sawfly, <u>Trichiosoma</u> sp.	11	Willow Alder Birch	Few in beating samples from 3 hosts throughout District.
Green-headed spruce sawfly, <u>Pikonema dimmockii</u> (Cress.)	49	W. spruce	Taken commonly in forested areas.
Weevil, <u>Pissodes</u> sp.	5	W. spruce	Few infested tips found throughout Clearwater Forest District.
Green spruce looper, <u>Semiothisa granitata</u> Gn.	33	W. spruce	Collected from spruce in all areas visited.
Looper, <u>Semiothisa pernlexa</u> McD.	26	Lp. pine	Low populations observed throughout forested areas from beating samples.
Green larch looper, <u>Semiothisa sexmaculata</u> Pack.	6	Larch	Found in endemic numbers in all larch stands examined.
Phalaenid, <u>Zenobia plenonectusa</u> Grt.	16	T. aspen	No change in populations from previous years.

DISEASE CONDITIONS

Dwarf mistletoe, Arceuthobium americanum Nutt. ex Engelm.

An outbreak of dwarf mistletoe on pine 15 miles west of the Upper Saskatchewan Ranger Station was reported in 1959. This area was examined by personnel of the Forest Biology Laboratory in 1960. The infection covered 2 square miles and approximately 70 per cent of the trees were affected. An outbreak not previously reported was found 7 miles southwest of Water Valley. In this area, which covered one square mile, 75 per cent of the trees were infected. These trees ranged from 6 to 10 inches in diameter and from 25 to 40 feet in height. Another area infected by this disease was found 3 miles east of the Red Deer Ranger Station. This outbreak will be mapped and a detailed survey made during the 1961 season.

Atropellis canker, Atropellis piniphila (Weir) Lohman & Cash

An outbreak of Atropellis canker on pine not previously reported was recorded along an Atlas Haul Road 5 miles east and 13 miles north of Nordegg. Approximately 80 per cent of the trees were infected with an average of 3 cankers per tree. Personnel of the Forest Biology Laboratory spent some time examining this area along with outbreaks 30 miles north of Nordegg at Chungo Creek and 7 miles south of the Clearwater Ranger Station. These outbreaks together with previously reported areas of infections shows that this disease is widespread throughout the forested areas of District 2. Examinations showed no noticeable change in intensity or the incidence of this canker in previously reported outbreaks.

Cone rust, Chrysomyxa pyrolata Wint.

Spruce cones affected by this rust were found in 2 of the Federal Forestry seed plots in the Red Deer Forest Reserve. The first was recorded approximately 12 miles up the Ya Ha Tinda Ranch Road. The second was reported 2 miles east of the Red Deer Ranger Station along the Sundre Road. In both instances 10 per cent of the cones were infected by this rust.

Number	Location	Host	Notes
2-4	6 miles south of Clearwater Ranger Station	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	Traces not apparent; healthy except for fringe trees that are dead.
2-5	Caroline	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	No permanent damage evident to spruce trees in the Caroline area.
2-6	15 miles west of Caroline	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	Numerous infections and aerial plants present.
2-7	10 miles east of Sundre	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	Heavy infection to pine over approximately 1 square mile.
2-8	30 miles north of Rocky Mtn. House	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	This stand almost entirely recovered.
2-9	15 miles west of Upper Saskatchewan Ranger Station	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	Heavy infection on all trees.
2-10	15 miles north west of Sundre	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	New outbreak estimated during 1960.
2-11	7 miles southwest of Water Valley	<u>Chrysomyxa pyrolata</u> (Wint.) Lohman & Cash	Observed during 1960 season. No survey conducted to establish size or intensity of outbreak.
2-12	12 miles west of Red Deer Ranger Station	<u>Chrysomyxa pyrolata</u> Wint.	Infesting cones in the Red Deer Ranger District.

TABLE V

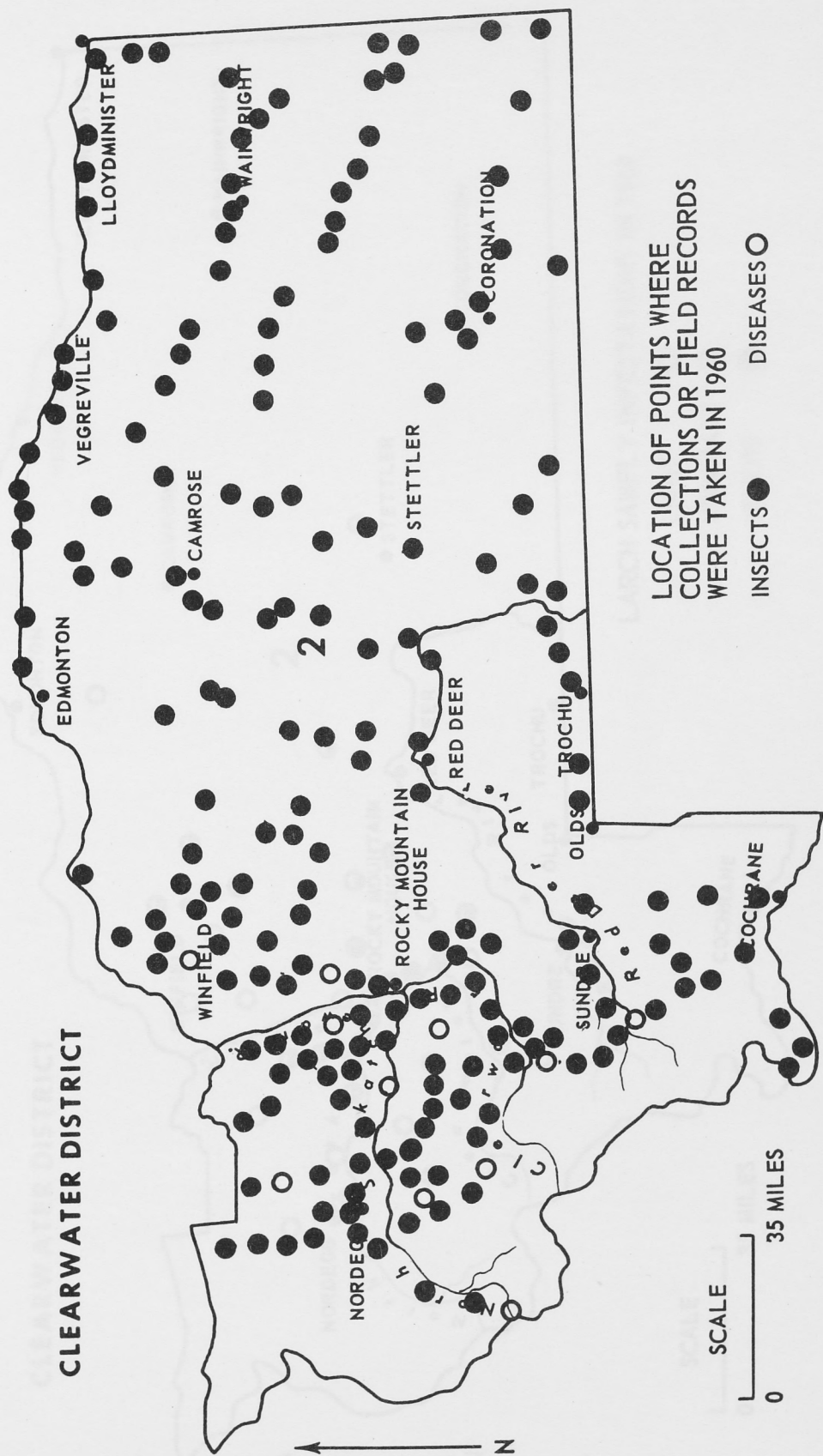
SUMMARY OF RECORDED DISEASE OUTBREAKS

Outbreak Number	Location	Causal organism	Remarks
2-1	18 miles north of Clearwater Ranger Station	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	No change from 1959. Outbreak extends over greater area than reported.
2-2	37 miles west of Red Deer Ranger Station	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Detailed study showed heavy incidence of this canker.
2-3	23 miles north of Nordegg	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Detailed study showed heavy incidence of this canker.
2-4	6 miles south of Clearwater Ranger Station	Climate (Red belt)	Trees now appear healthy except for fringe trees that are dead.
2-5	Caroline	Climate (Late frost)	No permanent damage evident to aspen trees in the Caroline area.
2-6	15 miles west of Caroline	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Numerous infections and aerial plants present.
2-7	10 miles east of Nordegg	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Heavy infection to pine over approximately 1 square mile.
2-8	30 miles north of Rocky Mtn. House	Heat and smoke injury	This stand almost entirely recovered.
2-9	16 miles west of Upper Saskatchewan Ranger Station	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Heavy infection on all trees.
2-10	18 miles north east of Nordegg	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	New outbreak examined during 1960.
2-11	7 miles southwest of Water Valley	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Observed during 1960 season. No survey conducted to establish size or intensity of outbreak.
2-12	12 miles west of Red Deer Ranger Station	<u>Chrysomyxa pirolata</u> Wint.	Infecting cones in the Red Deer Ranger District.

TABLE VI
SUMMARY OF DISEASE COLLECTIONS

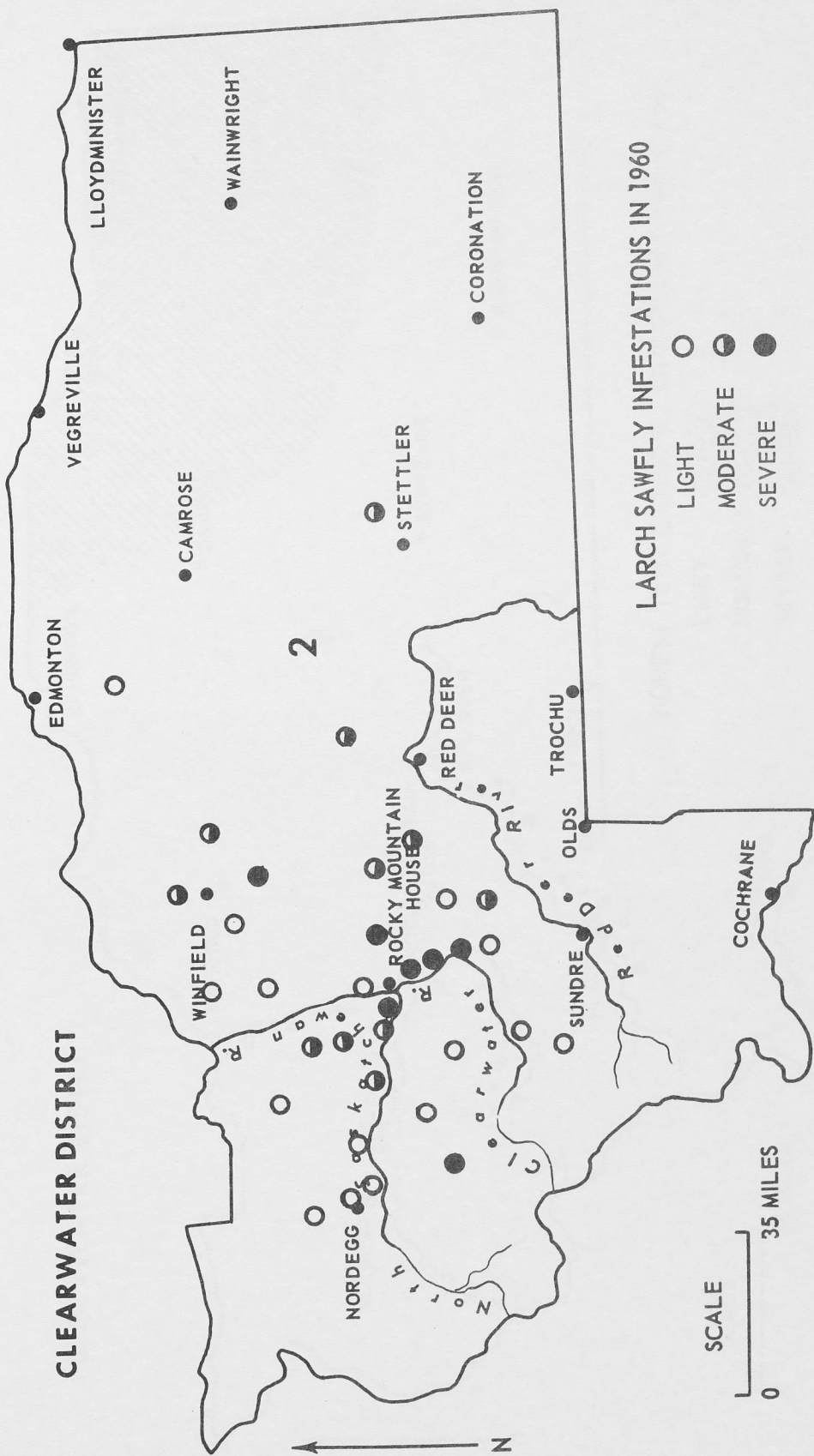
Pathological Agent	Host	Location	Remarks
<u>Didymium stalactiforme</u> & K.	Lp. pine	Crimson Lake	Common on regeneration pine.
<u>Didymium harknessii</u> (ore)	Lp. pine	Rocky Mountain House	General throughout the area.
<u>Dothiorella piniphila</u> (ir) Lohman & Cash	Lp. pine	18 miles north-east of Nordegg	New outbreak, heavy infection.
<u>Dothiorella americana</u> t. ex Engelm.	Lp. pine	7 miles southwest of Water Valley	New outbreak.
<u>Dothiorella americana</u> t. ex Engelm.	Lp. pine	3 miles east of Red Deer Ranger Station	New outbreak.
<u>Dothomyxa pirolata</u> t.	W. spruce	Ya Ha Tinda road, Red Deer District	Infecting cones throughout area.

CLEARWATER DISTRICT

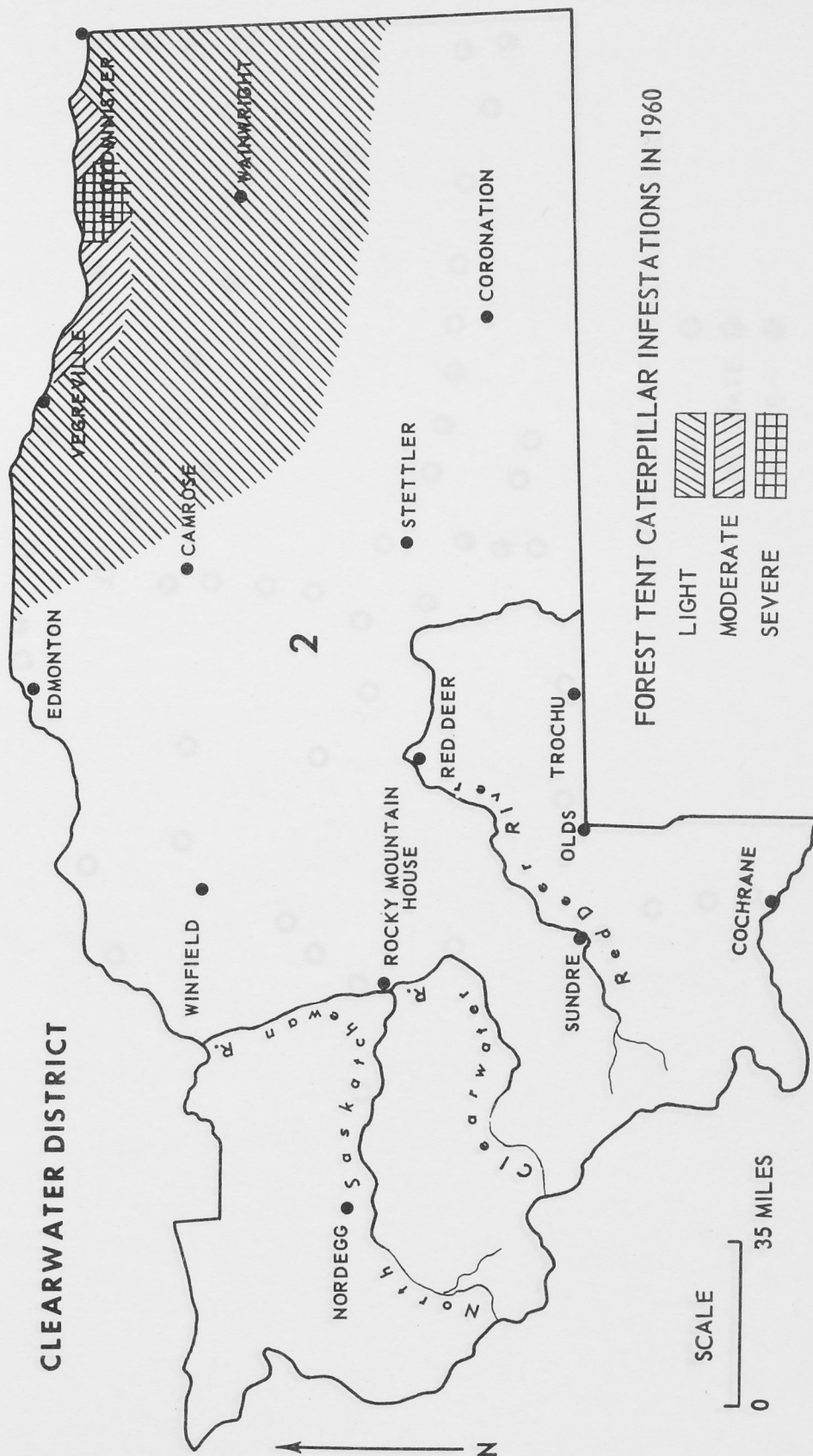


LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1960

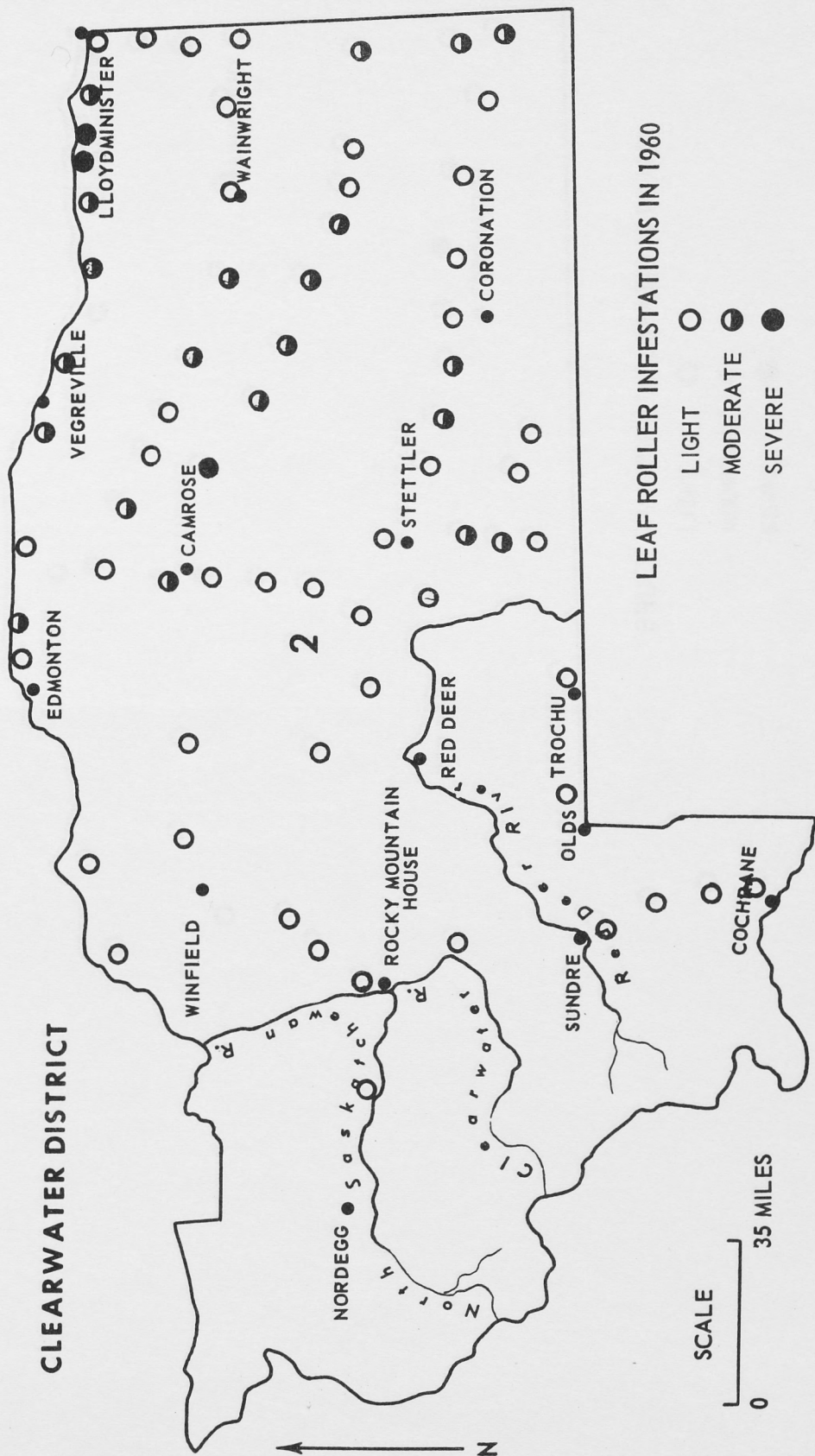
INSECTS ● DISEASES ○

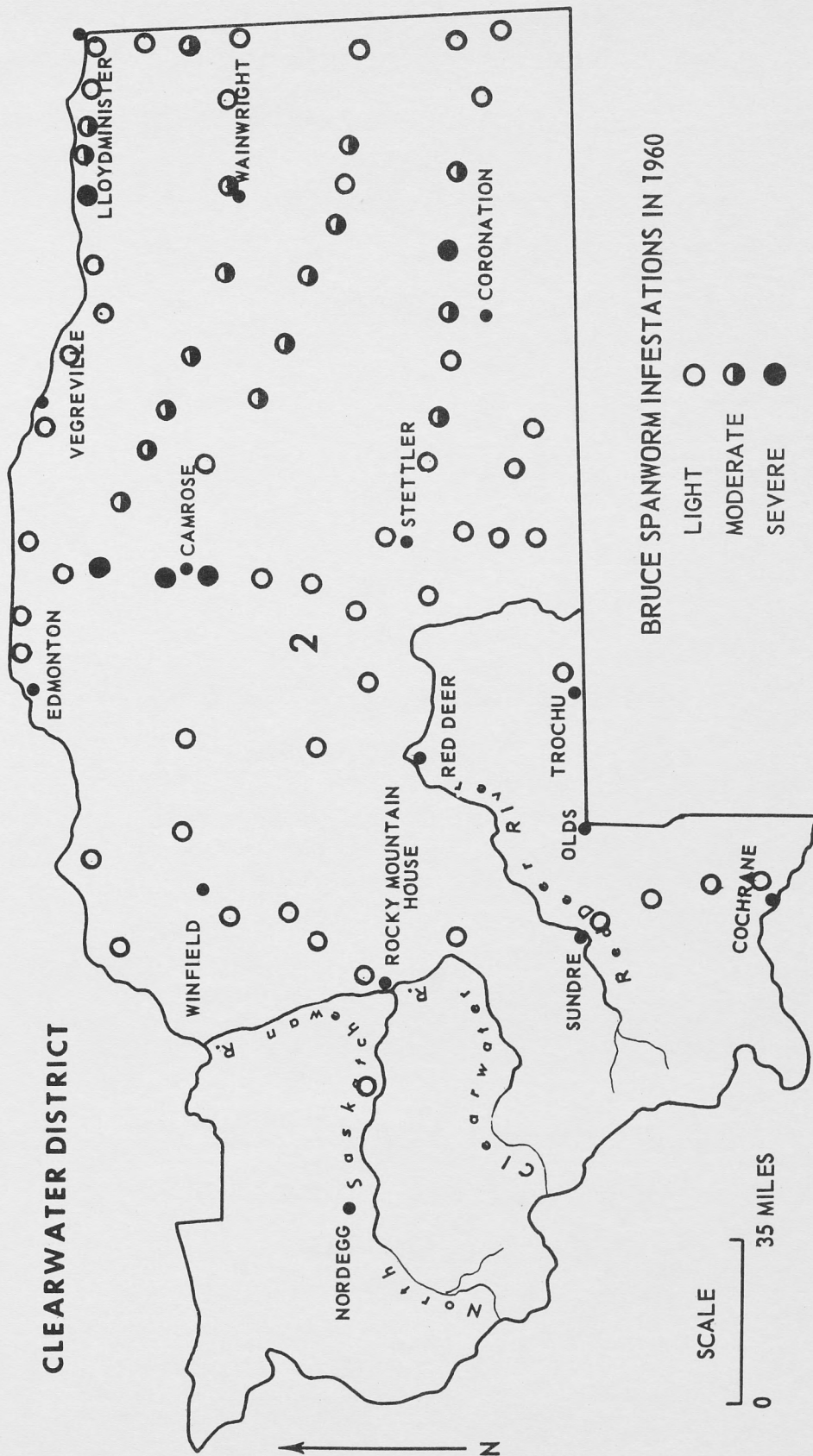


CLEARWATER DISTRICT



FOREST TENT CATERPILLAR INFESTATIONS IN 1960





FOREST BIOLOGY RANGER REPORT

NATIONAL PARKS DISTRICT

ALBERTA 1960

by

J. PETTY

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, Alberta

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1961

INTRODUCTION

Forest insect survey investigations in the National Parks District commenced June 1st. and ended September 23rd. The number of miles travelled by truck on Forest Insect and Disease Survey in the Southern Division was 18,243 and by aircraft was 900.

Two weeks prior to the field season in the National Parks District were spent instructing and working with the new ranger in the Crowsnest-Bow River District.

During the field season assistance to the lodgepole needle miner project was rendered by helping make the egg sample and fall larval sample from the sample stations set up in Banff and Yoho National parks. As in previous years, data were recorded from the phenology plots and the Dominion Forest Service seed plots within the District. Special surveys and investigations in the other districts of Division I included a trip into Edwards Mill site west of Nordegg, re-examination of spruce in the Castle River area south of Blairmore, and aerial surveys for aspen defoliation in Districts I and 2.

There were no significant changes in the general insect conditions in the National Parks District from those reported in 1959. Poplar serpentine miners were found in all areas but the centre of heavy infestation moved east from where it was found last year, leaving moderate to light infestations along the western boundary of Yoho and Jasper National parks. The spruce budworm infestation remained much the same as in 1959 except that it was found to extend east from Saskatchewan Crossing in Banff National Park to the Park Boundary.

An increase in the populations of lodgepole needle miner was evident from egg samples taken from the sample plots in Banff National Park.

Two new disease outbreaks were recorded in the District in 1960.

These were infestations of dwarf mistletoe on lodgepole pine, one near Johnson Canyon, Banff National Park, and the other between the Astoria and Whirlpool Rivers in Jasper National Park. Re-examination of 4 outbreaks resulted in 2 of these, both red belt, being discontinued because no new injury was evident this year. No change was noted in the other 2 outbreaks.

Drought conditions in July and August caused discoloration and shedding of the foliage of conifers in some areas in Banff and Kootenay National Parks.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS

AND REPORTS BY HOST TREES

Coniferous Hosts	Insect Colls. Repts.		Disease Colls. Repts.		Deciduous Hosts	Insect Colls. Repts.		Disease Colls. Repts.	
Spruce	47	4	2	0	Willow	22	0	0	0
Pine	20	31	12	0	T. aspen	12	7	2	0
Fir	14	1	1	0	Poplar	7	0	0	0
Larch	2	0	0	0	Alder	3	0	0	0
	—	—	—	—		—	—	—	—
Totals	83	36	15	0		44	7	2	0
Collections from Miscellaneous Hosts									21
Grand Total									208

INSECT CONDITIONS

Spruce budworm, Choristoneura fumiferana (Clem.)

Moth flight of the 2-year life cycle spruce budworm occurred in the National Parks in 1960. Because of the larger larvae, damage to spruce by this insect was more noticeable than in 1959. Highest populations were observed in a stand of spruce and alpine fir 2 miles south of Saskatchewan Crossing in Banff National Park, where moderate damage to the current years growth occurred in an area about one-half mile in diameter. Damage was found on both sides of the Saskatchewan River east from the Banff-Jasper Highway to the Park Boundary.

In Yoho National Park light damage was found along the Kickinghorse River from Boundary Creek to Emerald Creek, thence north to Emerald Lake, and at the mouth of the Yoho Valley.

The only location in Jasper National Park where spruce budworm was found was in a mature stand of spruce and alpine fir about 12 miles up the Whirlpool Valley. Very light damage was seen in this area.

Lodgepole needle miner, Evagora starkii Free.

Sequential sampling for this insect was carried out in all the parks during the latter part of September. Because of a suspected increase in population at the Mount Eisenhower sample plot, the most intensive sampling was done between Lake Louise and the East Park Gate in Banff National Park. In this area sampling was carried out at 5 mile intervals starting at the Park Gate. The only locations where evidence of damage was seen was at the Park Gate, the Mt. Norquay Road turnoff and 15.7 miles west of Banff. The infestations at these locations and 2 others, 52 and 62 miles north of Lake Louise along the Banff-Jasper Highway, were classed as light.

In Yoho National Park the only places where lodgepole needle miner was found was at Leachoil and 2 miles up the Yoho Valley. These infestations also fell into the light category.

Light infestations also were recorded at Leach Lake and three quarters of a mile up Marmot Basin Trail in Jasper National Park.

At Hawk Creek and Black Creek in Kootenay National Park the number of larvae per tip was higher than at other locations within the National Parks District but remained in the light category.

Poplar serpentine miner, Phyllocnistis populiella Cham.

The poplar serpentine miner was again found in all areas of the National Parks District where aspen grows. In Jasper National Park a heavy infestation was evident along the Athabasca Valley from Athabasca Falls to approximately 10 miles north of Jasper townsite, westward along the Miette Valley to Geikie and eastward to Maligne Canyon. North of Snaring River Bridge along the Jasper-Edmonton Highway the infestation decreased from moderate to very light at Fiddle Creek. Moderate infestations were also found west of Geikie to the Park boundary and east of Maligne Canyon to Medicine Lake. South of Athabasca Falls moderate to light infestations were found wherever aspen occurred.

Between Field and Leachoil, in Yoho National Park, where heavy damage was reported in 1959, only light to moderate damage was observed in 1960. Infestations throughout the remainder of this Park were light.

One other area of heavy damage was around Radium in Kootenay National Park. Throughout the remainder of Kootenay National Park and in Banff National Park only light infestations were recorded.

Engelmann spruce weevil, Pissodes engelmanni Hopk.

Shoot weevils were still present through Kootenay National Park south from Kootenay Crossing along the Kootenay River to the Park Boundary. The number of trees affected by this shoot weevil was about the same as in 1959.

Light damage was also seen in an area near the junction of the Otter-tail and Kickinghorse rivers and near Leancoil in Yoho National Park.

Pine needle scale, Phenacaspis pinifoliae (Fitch)

A light infestation of pine needle scale on Douglas fir has persisted in the area between the Aquacourt and the south gate of Kootenay National Park for the past several years. In 1960 a few trees near Sinclair Canyon were found to be heavily infested with this scale insect. Scale was also found on lodgepole pine in the area above Radium but only a light infestation was evident.

Spruce spider mite, Oligonychus ununguis (Jac.)

Infestations of spruce spider mite are still present in the townsites of Banff and Jasper and around Jasper Park Lodge. These infestations are light except on a few hedges and individual trees in Banff where medium populations were present.

Aphids, Macrosiphum carraganae Cholod., Periphyllus negundinis Thos.

Aphids on deciduous hosts were more noticeable in 1960 than in the last few years.

Light to moderate infestations of the caragana aphid M. carraganae were present on caragana hedges in Banff and Jasper townsites and in Field. In Field high populations of Coccinelidae were present with the aphid infestation.

Infestations of the boxelder aphid, P. negundinis, on Manitoba maple in the town of Banff were light and in Jasper townsite were moderate.

Leaf beetles, Chrysomella aenicollis Schffr.

These leaf beetles were found on willow in many areas of the National Parks District, particularly at the higher elevations. The largest area of infestation was seen along Sawback Creek north and east of Sawback Lake for about 3 miles. Severe defoliation of willow occurred in this area, the centre of which was 2 miles northeast of Sawback Lake.

Light damage was found along the Cascade River north of Banff to Jim Coon Creek and around Shadow Lake and Hector Lake in Banff National Park. Park wardens in Kootenay National Park reported damage by leaf beetles in some of the higher elevations in that Park. Samples sent in from those areas contained C. aenicollis.

Spruce gall aphids, Adelges cooleyi (Gill.)

An increase in the number of galls caused by the Cooley spruce gall aphid was noted in Banff and Jasper National Parks. In Banff National Park heavy infestations were present in the area east from Eisenhower Junction to Carrot Creek and from Banff Springs Golf Course up the Spray Valley approximately 2 miles. In Banff townsite a moderate infestation occurred. Moderate infestations in Jasper National Park were found in Jasper townsite and northwest along Celestine Lake Road for 2.5 miles from its junction with Highway 16.

The stage of this gall aphid which is found on Douglas fir was on that host in the Banff and Jasper areas.

TABLE II

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE NATIONAL PARKS DISTRICT, 1960)

Insect species	Number of collections	Host	Remarks
Black-headed budworm, <u>Accleris variaria</u> (Fern.)	5	W. spruce	Only a few larvae found in the Parks.
Pine root collar weevil, <u>Hylobius</u> sp.	4	Lp. pine	No notable change from 1959.
Western tent caterpillar, <u>Malacosoma pluviale</u> (Dyar)	3	Willow Rose B. cottonwood	Several tents found around Radium.
Balsam fir sawfly, <u>Neodiprion abietis</u> (Harr.)	6	W. spruce D. fir B. spruce	Light infestation near Radium.
Spiny elm caterpillar, <u>Nymphalis antiopa</u> L.	2	Willow	Fewer larvae at Banff and Radium than in 1959.
Pitch nodule makers, <u>Petrova albicapitana</u> (Busck)	3	Lp. pine	Still present south and west of Jasper and at Patricia Lake in Jasper National Park.
Larch sawfly, <u>Pristiphora erichsonii</u> (Htg.)	1	E. Larch	Very light at Mile 4 of Miette Hot Springs Road Jasper National Park.

DISEASE CONDITIONS

A needle cast, Lophodermium pinastri (Schrad. ex Fr.) Chev.

The outbreak of this needle cast of lodgepole pine reported in 1959 from the area north of Whirlpool River Bridge, Jasper National Park, was lighter in 1960. The size of the affected area remained the same as in 1959. In Kootenay National Park this needle cast was affecting the pine in the area served by the Settlers Road.

Needle rust, Chrysomyxa ledicola Lagerh.

Needle rust on white spruce was evident in the area between the Otter-tail River and Boulder Creek in Yoho National Park. Many of the spruce along the roadside had most of the current years growth affected.

Marssonina leaf spot, Marssonina tremuloidis Klub.

After an absence of some years this leaf spot was again evident on aspen in the Bow Valley between Eisenhower Junction and Banff townsite. The damage was sporadic and generally light but a few aspen groves had moderate damage.

TABLE III
SUMMARY OF RECORDED DISEASE OUTBREAKS

Outbreak Number	Location	Causal Organism	Remarks
3-1	Geraldine Lake Road	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1963.
3-2	Sundance Canyon	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined in 1961.
3-3	59.5 miles north Lake Louise Junction	<u>Peridermium stalactiforme</u> A. & K.	Re-examined 1960 - Area a little larger than first reported.
3-4	Cascade Valley	<u>Hypodermella montivaga</u> (Petrak) Dearn.	No needle cast present when last examined 1958.
3-5	Poboktan Creek Valley	<u>Hypodermella montivaga</u> (Petrak) Dearn.	No needle cast present when last examined 1958.
3-6	Baker Creek Valley	<u>Hypodermella montivaga</u> (Petrak) Dearn.	No needle cast present when last examined 1958.
3-7	Mount Coleman	<u>Hypodermella montivaga</u> (Petrak) Dearn.	No needle cast present when last examined 1958.
3-8	Mount Edith Cavell Road, Astoria Valley	<u>Hypodermella montivaga</u> (Petrak) Dearn.	No needle cast present when last examined 1958.
3-9	Snaring River	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Re-examined 1960 - no noticeable change.
3-10	Medicine Lake Road	Red Belt.	Discontinued 1960.
3-11	Athabasca Valley Maligne Mountain	Red Belt.	Discontinued 1960.

SUMMARY OF RECORDED DISEASE OUTBREAKS cont'd.

Outbreak Number	Location	Causal Organism	Remarks
3-13	North Jasper town-site.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Still present and killing trees.
3-14	Marmot Basin Trail	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	To be re-examined 1962.
3-15	10 miles west Banff	<u>Rhabdocline pseudotsugae</u> Syd.	To be mapped 1961.
3-16	10 miles south Jasper	<u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	Lighter than in 1959. To be mapped in 1961.
3-17	Settlers Road	<u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	Moderate damage - to be mapped in 1961.
3-18	Settlers Road	<u>Hypodermella laricis</u> Tub.	To be mapped in 1961.
3-19	Settlers Road	<u>Peridermium harknessii</u> Moore	To be mapped in 1961.
3-20	Between Mount Eisenhower and Johnson's Canyon	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Groups of Ip. pine 100 per cent affected. One spruce affected.
3-21	Between Astoria and Whirlpool Rivers.	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Scattered areas 100 per cent affected.

TABLE IV
SUMMARY OF DISEASE COLLECTIONS

Causal Agent	Host	Location	Remarks
<u>Arceuthobium americanum</u> Mutt. ex Engelm.	W. spruce	West of Johnson's Canyon, B.N.P. Takkakaw Falls, Y.N.P.	Few trees infected. Heavy in small area.
<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	T. aspen	Cottonwood Creek, J.N.P.	Trees dying in small area.
<u>Atropellis piniphila</u> (Weir) Lohman & Cash.	Lp. pine	West of Geikie, J.N.P. Near Cobb Lake, K.N.P.	Few trees infected in small area. Heavy in Cobb Lake area.
<u>Chrysomyxa ledicola</u> Lagerh	W. spruce	Ottertail Creek, Y.N.P.	On most spruce between Ottertail and Boulder creeks.
<u>Chrysomyxa pirolata</u> Wint.	W. spruce	Healy Creek B.N.P.	Light damage to cone crop.
<u>Cladosporium herbarum</u> Link ex Fr.	Lp. pine	5 miles north of Sawback Lake, B.N.P.	On trees which had been girdled by rodents.
<u>Coleosporium solidaginia</u> Thum	Lp. pine	Leanchoil	Rust on needles in small area.
<u>Cronartium</u> sp.	Lp. pine	Eisenhower Field Station	White spored rust.
<u>Peridermium harknessii</u> Moore	Lp. pine	Whirlpool River Crossing, Banff- Jasper Highway.	Small area found, mostly on smaller trees.
<u>Peridermium stalactiforme</u> A. & K.	Lp. pine	Eisenhower Field Station	Few rust cankers in this area.
<u>Elytroderma deformans</u> (Weir) Darker	Lp. pine	10 miles south of Jasper	Needle cast mixed with <u>Lophodermium</u> <u>pinastri</u> .

SUMMARY OF DISEASE COLLECTIONS cont'd.

Fungal Agent	Host	Location	Remarks
<u>Uromyces</u> <u>globosum</u> Arn.	Juniper	Radium	Fairly numerous on a few juniper above Radium town- site.
<u>Uromyces</u> <u>juvenescens</u> Arn.	Saskatoon	West of Banff	Light over small area.
<u>Dothidea</u> <u>pinastri</u> (Schrader, ex Fr.) Chev.	Lp. pine	Settlers Road	Found on most pine along Settlers Road.
<u>Marssonina</u> <u>tremuloidis</u> Leb.	T. aspen	Between Banff and Eisenhower Junction.	Very spotty in this area.
<u>Phacidium</u> <u>infestans</u> Arst.	D. fir	Yoho Valley	Heavy on one tree. New record.

BANFF NATIONAL PARK

3

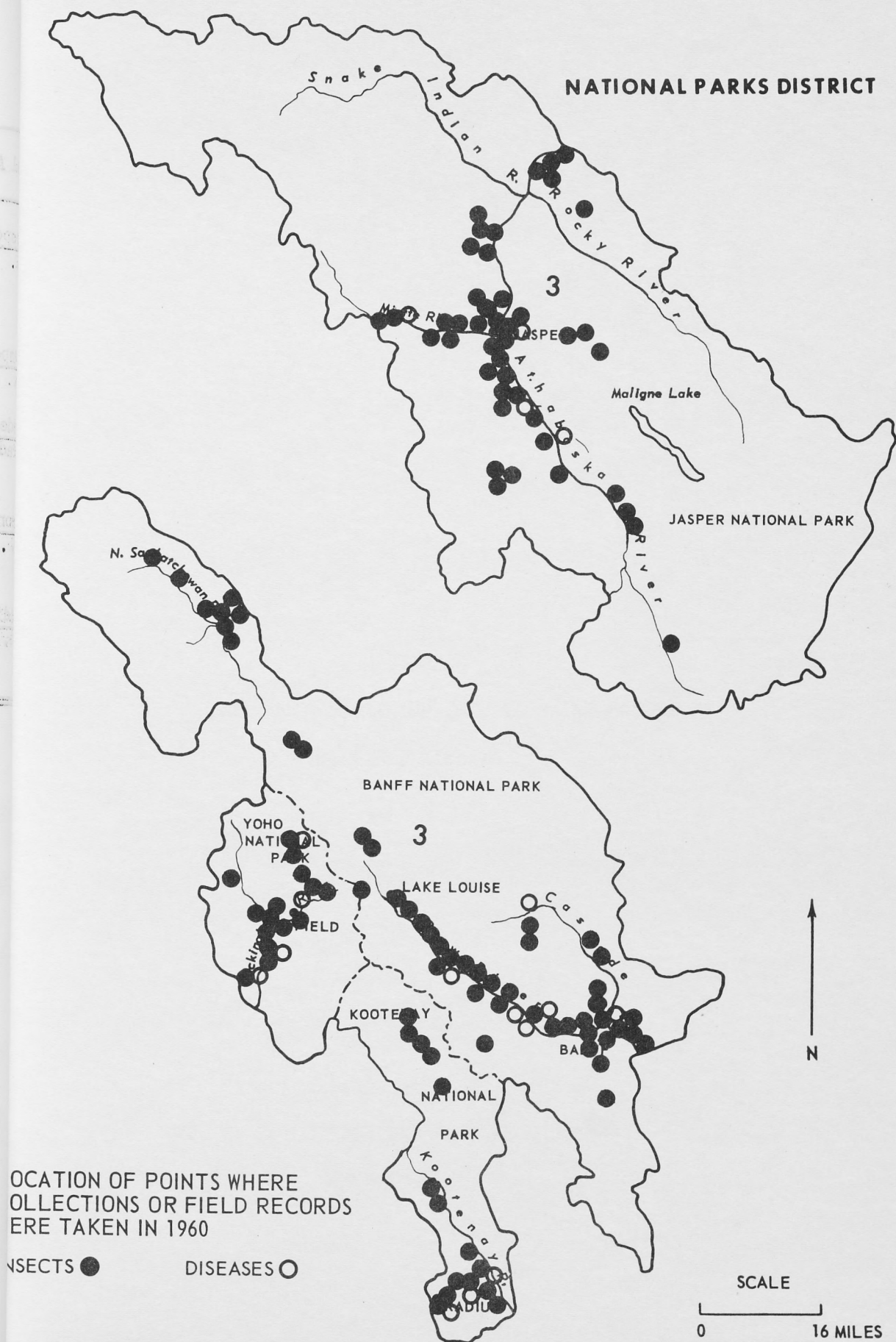
LAKE LOUISE

KOOTENAY

NATIONAL
PARK

LOCATION OF PLANTS WHERE
COLLECTIONS OF FIELD RECORDS
WERE TAKEN IN 1950

INSECTS ● DISEASES ○



FOREST BIOLOGY RANGER REPORT
BRAZEAU - ATHABASCA DISTRICT
ALBERTA 1960

by

V. B. PATTERSON
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, Alberta

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1961

INTRODUCTION

This report covers tree insect and disease conditions in the Brazeau-
basca District in 1960. General field survey work was carried out from
31 to September 29, during which time 10,909 miles were travelled by truck
approximately 370 miles by air.

An aerial survey to check on aspen defoliation was conducted in July
in conjunction with Districts 6 and 7. Assistance was given to the Lac La Biche
Forest Ranger on 2 aerial surveys in that District. The tent caterpillar sequential
sampling plot at Edmonton was re-examined and new sampling stations were established
at Whitecourt, Little Smoky Post and Blue Ridge. Work was continued on the
biology project which was established in 1959. The larch sawfly permanent sample
plots were re-checked and sampled as in previous years.

Prior to the start of field work, 2 weeks were spent on repair and
maintenance at Entrance Ranger Cabin; in October, another week was spent levelling
and landscaping the grounds. The weather pattern was similar to 1959. Heavy
rains were general during the last 2 weeks in June and throughout most of August.

A sharp upswing in population levels of the forest tent caterpillar was
recorded. Other aspen defoliators did less damage generally than in 1959.
Larch sawfly was found almost everywhere that larch occurred and at many locations
the injury was more severe than in 1959. A slight downward trend in the population
levels of the yellow-headed spruce sawfly was recorded.

There was only one major addition to the recorded distribution of tree
diseases. Dwarf mistletoe outbreaks were mapped along the Athabasca River both
east and west of Fort Assiniboine.

A number of known disease outbreaks were re-examined but there was appreciable boundary changes in any of them.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Various s	Insect		Disease		Deciduous Hosts	Insect		Disease	
	Colls.	Repts.	Colls.	Repts.		Colls.	Repts.	Colls.	Repts.
	44	0	0	0	T. aspen	122	0	1	0
	29	0	2	0	Willow	14	0	0	0
	19	0	3	0	Alder	5	0	0	0
	—	—	—	—		—	—	—	—
	92	0	5	0		141	0	1	0
Collections from Miscellaneous Hosts									8
Grand Total									247

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosoma disstria Hbn.

Infestations of the forest tent caterpillar broke out in 3 separate areas in the Brazeau-Athabasca District in 1960.

A large area of moderate to heavy defoliation occurred north of the Athabasca River Valley from a point 2 miles east of Whitecourt to approximately 10 miles east of the Blue Ridge Ferry. The northern boundary of this area

irregular line running more or less parallel to the Athabasca River at a distance of from 2 to 3 miles, and the southern boundary was roughly the valley

Another outbreak was recorded 2 miles west of Whitecourt on the south side of the Athabasca River. Heavy defoliation occurred in an area approximately 1 mile wide by 3 miles long.

Between these 2 heavily infested areas, pockets of moderate defoliation were found on the south side of the Athabasca from the McLeod River to Blue Ridge. Eggs and cocoons were also recorded at a number of points in the surrounding area from a point 6 miles southwest of Whitecourt to 9 miles northwest of Ponikvoine.

The third outbreak was at the northwestern edge of the District. It extended southeast from Little Smoky Settlement for approximately 14 miles and was located mostly entirely between the Little Smoky River and Highway 34. Injury was light to heavy in patches but light generally.

Single collections were made at Pibroch, Pickardville, Tomahawk and Ponikvoine.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1960	Actual Defoliation for 1960	Predicted Defoliation for 1961
Hinton	Not noticeable	Nil	Not noticeable
Ridge*		Heavy	Noticeable
Whitecourt*		Heavy	Noticeable
Peace Smoky*		Light	Noticeable

* Established in 1960.

leaf-tier, Pseudexentera improbana oregonana Wlsh. m.

This species of leaf-tier was found throughout the Brazeau-Athabasca District wherever aspen poplar is the predominant species.

Defoliation was recorded along the west side of the McLeod and Athabasca Rivers from Medicine Lodge to Timue and throughout all of the District lying east of the McLeod River. Outside of this general area, pockets of infestation were found in the Hinton-Coalspur area and near Iosegun Lake.

Moderate injury occurred along Highway 43 for 10 miles east and west of Whitecourt. In the area along the north side of the Athabasca River from Whitecourt to Timue, injury was also moderate. Pockets of moderate defoliation were found throughout the area lying north of Highway 43 between the Athabasca and Pembina Rivers. Aspen throughout the area lying east of the Pembina River was infested to some degree, mostly in the light to moderate injury range. Heavy injury was recorded

sawfly, Pristiphora ericksonii (Htg.)

An attempt was made to carry out a more comprehensive study of the sawfly situation in the Brazeau-Athabasca District in 1960. Representative trees were taken throughout the surveyed area wherever larch was growing and it was found that only a very few larch stands in the District were entirely free of this pest.

Severe defoliation occurred in some stands but this did not always indicate the presence of a high larval population. Low tree vigor was often responsible for below-normal foliage production and on these trees a few larvae could cause severe defoliation. On the other hand, the injury caused by an equal number of larvae on vigorous trees was negligible. Damage appraisal therefore had to be based on foliage loss alone and population levels were not taken into consideration.

Larch stands scattered throughout the agricultural area east of the Pembina River showed less defoliation than in 1959. West of the Pembina River, between Highways 16 and 43, conditions were much the same as in 1959. Defoliation was moderate in a few swamps in the Rosevear-Carrot Creek area and also in the north of Mackay. North of Highway 43 moderate defoliation occurred in most larch stands. On the north side of the Athabasca from the Blue Ridge ferry to the Swan Hills road northwest of Fort Assiniboine, defoliation was moderate generally and heavy in patches. Along Highway 43 from Whitecourt to the Smoky Settlement and along roads leading off from the highway, defoliation was light. West of the McLeod River, light defoliation occurred between Whitecourt and Edson. Farther west, moderate defoliation occurred in a few larch stands around the area. In the area between Entrance and Muskeg River, injury to the few widely scattered larch stands was light.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS.

Station Number	Location	Infestation class 1959	Infestation class 1959	Infestation class 1960
4-1	Edmonton	Severe	Moderate	Light
4-2	Gainford	Moderate	Light	Light
4-3	Peers	Nil	Light	Nil
4-4	Mercoal	Nil	Light	Moderate
4-5	Obed	Nil	Nil	Light
4-6	Muskeg River	Nil	Nil	Nil
4-7	Whitecourt	Severe	Moderate	Light
4-8	Iosegun Lake	Light	Nil	Nil
4-9	Barrhead	Severe	Severe	Severe
3-1	Miette	Not checked	Not checked	Light

along the North Saskatchewan River in southwest Edmonton and along Highway 16 between Stony Plain and Carvel Corner.

Light injury was recorded as follows: south from Chip Lake to the Pembina River; along Highway 16 from Carrot Creek to Peers and north along the McLeod River to Whitecourt; and in the general areas of Obed, Coalspur, Hinton and Iosegun Lake.

Grey willow leaf beetle, Galerucella decora Say

Adults of the grey willow leaf beetle were found at a number of locations east of the Pembina River on willow, aspen and balsam poplar. Most of the collections were taken south of a line running east and west through Lac La Nonne. This was roughly the same area that was infested in 1959, but injury this year was generally lighter. High populations of adults were present in an area of 8-10 acres northwest of Devon in early June, but injury was light.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Populations of the yellow-headed spruce sawfly in the Brazeau-Athabasca District continued at about the same level as in 1959. With the exception of 2 areas, injury to individual shelterbelts was light. In the Barrhead-Westlock-Morrinville area, moderate defoliation was confined mostly to the northwestern corner around Shoal Lake. In the remainder of this general area defoliation was light. There was little change in the defoliation pattern which was reported in 1959, in the Edmonton-Stony Plain area. A small percentage of the shelter-belts checked showed moderate defoliation but in the majority injury was negligible.

TABLE IV

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE BRAZEAU-ATHABASCA DISTRICT, 1960)

Insect species	No. of collections	Host	Remarks
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	14	T. aspen	Low population levels throughout eastern half of District.
A leaf miner, <u>Gracillariidae</u>	6	Alder	Light generally along roadsides. Moderate to severe injury between Peers and Whitecourt.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	6	T. aspen	Injury lighter than in 1959. Moderate in Entrance-Hinton area only.

DISEASE CONDITIONS

Dwarf mistletoe, Arceuthobium americanum Nutt. ex Engelm.

The occurrence of dwarf mistletoe of pine was recorded in the area north of the confluence of the Clearwater and Athabasca Rivers, approximately 17 miles northeast of Ft. Assiniboine. Aerial plants were found on all age classes of Jack pine throughout an area 5 miles long and a quarter of a mile wide. Heavy brooming throughout the stand resulted in numerous dead tops and branches on over-mature trees.

Evidence of this disease was also reported in a small area 4 miles north of Vega and at one location along the road from Blue Ridge to Ft. Assiniboine.

The infected area south of Whitecourt was re-examined but there was no evidence of any change in intensity or boundaries.

TABLE V
SUMMARY OF RECORDED DISEASE OUTBREAKS

Outbreak number	Location	Causal organism	Remarks
4-1	Lovett	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Not checked
4-3	Whitecourt	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	Unchanged from 1959 examination
4-4	Robb-Coal-spur	Red Belt	Unchanged from 1959 examination
4-5	Robb	<u>Armillaria mellea</u> (Vahl ex Fr.) Quel.	Re-examine 1963
4-7	Mercoal	Red Belt	No evidence of permanent injury
4-8	Entrance	Red Belt	Not located 1960
4-9	Hinton	<u>Peridermium harknessii</u> Moore <u>Peridermium stalactiforme</u> A. & K.	Re-examine 1961
4-10	Hinton	<u>Cronartium sp.</u>	Re-examine 1963
4-11	Hinton	<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Not checked
4-12	Entrance	<u>Cronartium sp.</u>	Re-examine 1963
4-13	Robb	<u>Peridermium harknessii</u> Moore	Re-examine 1963
4-14	Robb	<u>Peridermium stalactiforme</u> A. & K.	Re-examine 1963

TABLE V

SUMMARY OF RECORDED DISEASE OUTBREAKS (cont'd)

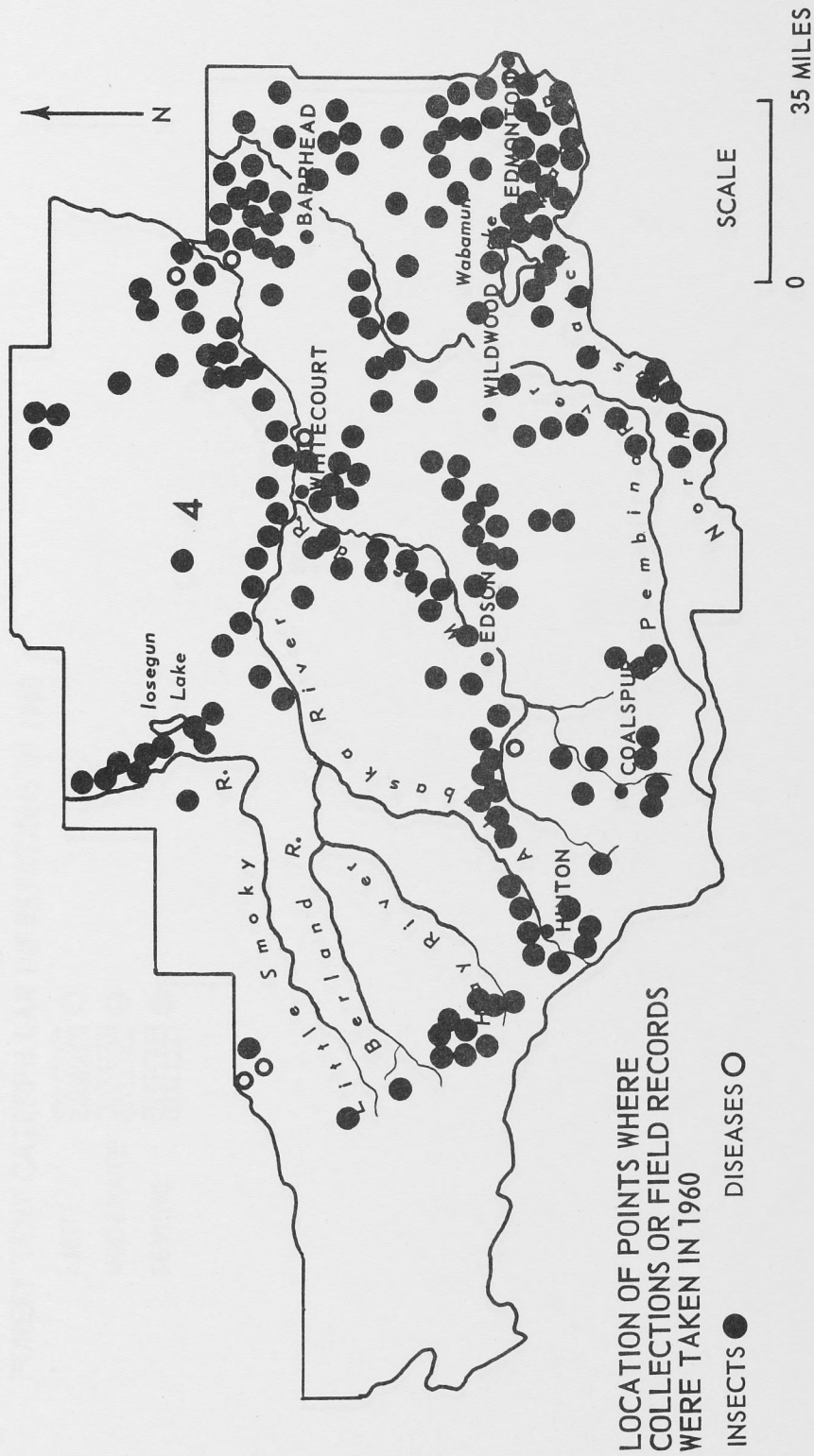
Outbreak number	Location	Causal organism	Remarks
4-15	Whitecourt	Unknown cause of dying lp. pine	First recorded 1960 Further investigation 1961
4-16	Whitecourt	Needle rust	New distribution record 1960
4-17	Whitecourt	Needle rust	New distribution record 1960
4-18	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm	New distribution record 1960
4-19	Fort Assiniboine	<u>Arceuthobium americanum</u> Nutt. ex Engelm.	New distribution record 1960

TABLE VI

SUMMARY OF DISEASE COLLECTIONS

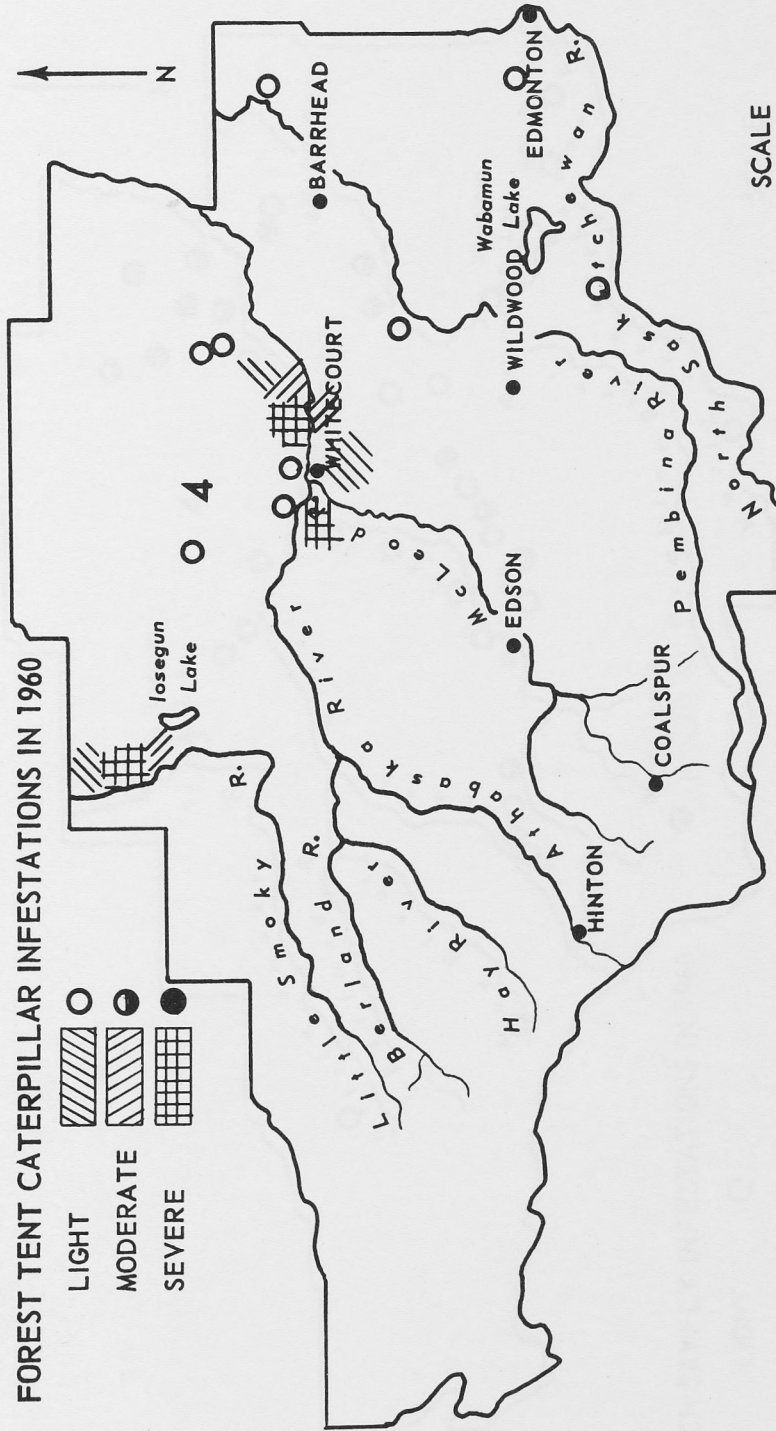
Causal Agent	Host	Location	Remarks
<u>Arceuthobium americanum</u> Nutt. ex Engelm.	J. pine	Vega, Ft. Assiniboine	Dwarf mistletoe
<u>Atropellis piniphila</u> (Weir) Lohman & Cash	lp. pine	Simonette Tower	Stem and branch cankers
<u>Chrysomyxa ledi</u> de Bary	W. spruce	Simonette Tower	Needle rust. Heavy on regeneration spruce in Big Smoky River Valley
<u>Peridermium coloradense</u> (Diet.) A. & K.	B. spruce	Medicine Lodge	Yellow witches broom numerous in this area
<u>Sclerotium confundens</u> Whetz.	T. aspen	Whitecourt	Tar spot. Moderate in this area

BRAZEAU-ATHABASKA DISTRICT

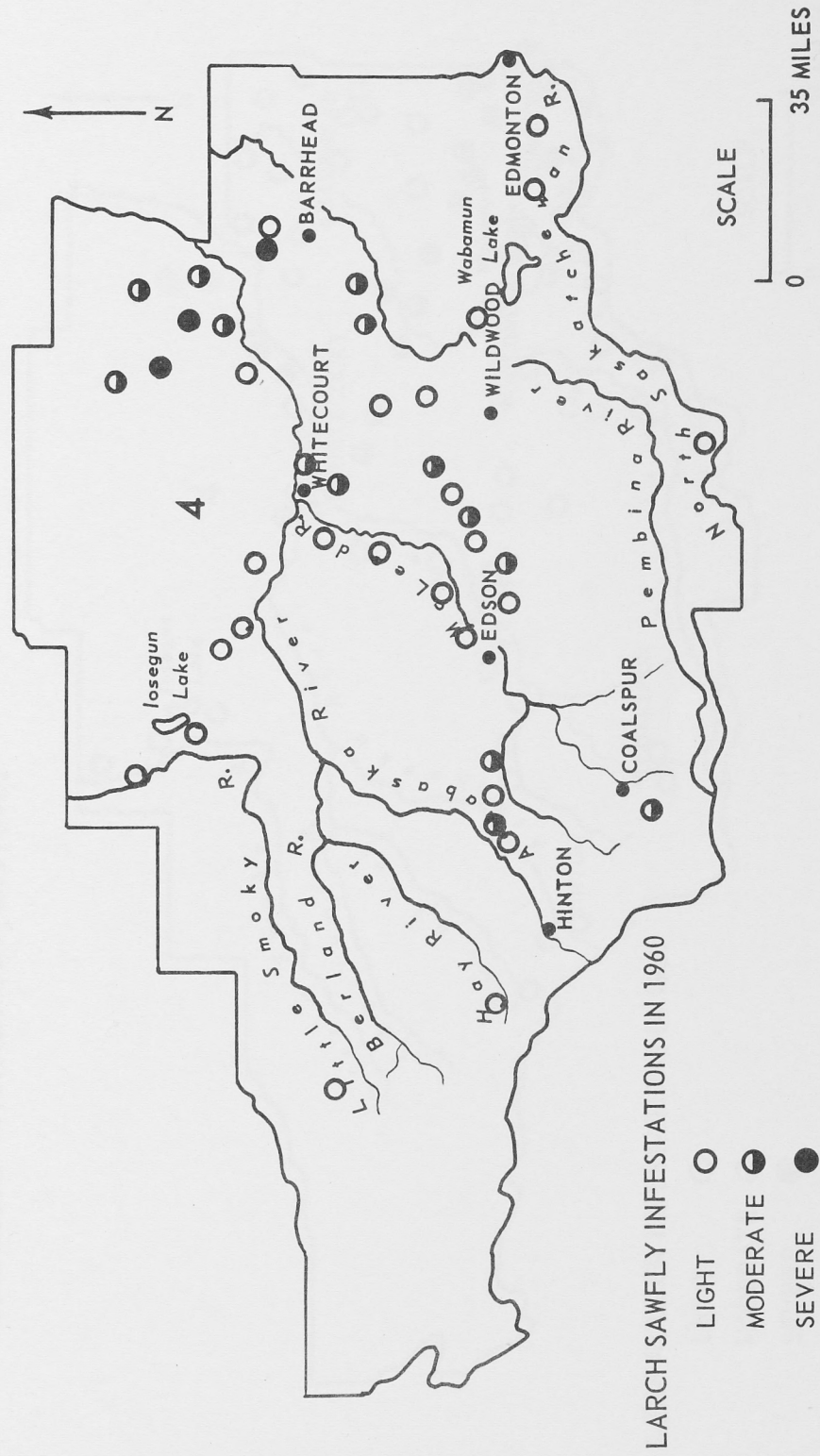


BRAZEAU-ATHABASKA DISTRICT

FOREST TENT CATERPILLAR INFESTATIONS IN 1960

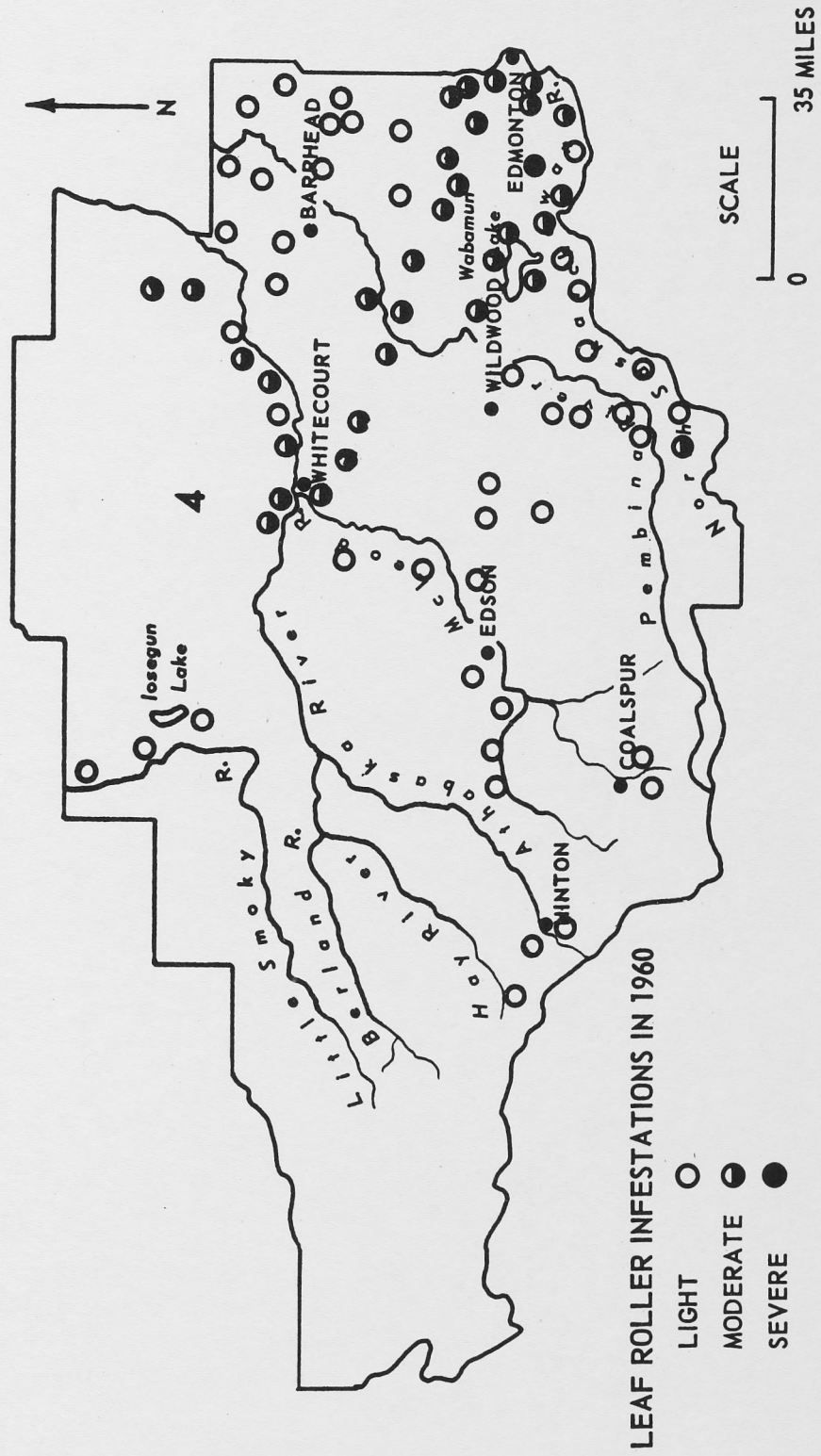


BRAZEAU-ATHABASKA DISTRICT



LARCH SAWFLY INFESTATIONS IN 1960

BRAZEAU-ATHABASKA DISTRICT



FOREST BIOLOGY RANGER REPORT

LAC LA BICHE DISTRICT

ALBERTA 1960

by

N. W. WILKINSON

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, Alberta

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1961

INTRODUCTION

Presented herewith is the report of the Forest Insect and Disease survey in the Lac la Biche District. Survey work began on May 26 and continued until October 14. Approximately 9,412 miles were travelled by motor vehicle and 1,472 miles by aircraft on survey work.

Immediately prior to the field season, the interior of the Lac la Biche ranger cabin was cleaned and varnished, weather records were taken and hatching data obtained in connection with a forest tent caterpillar project, and 3 phenology plots were established.

During the field season work on a number of special projects was carried on. Growth measurements were taken at 4 of the 5 phenology plots in the District. Spruce seed and data were collected for the Federal Forestry Branch. Sequential sampling methods were used to obtain forest tent caterpillar defoliation estimates on 22 plots throughout the District. Special collections of 200 larvae each were taken from 4 of these plots. One collection of 200 yellow-headed spruce sawfly larvae was taken for parasite studies. Special collections of the twice-stabbed lady beetle, Chilocorus stigma Say., were made and mailed to Dr. S. G. Smith at the Sault Ste. Marie Laboratory.

On completion of the field season, landscaping of the cabin lot was carried on. One week was utilized in assisting the Ranger in the adjoining Clearwater District with sequential sampling and the establishment of new forest tent caterpillar sequential sample plots.

Temperatures in May and June were below normal and heavy rains during this period rendered new grades and reconstructed roads impassable. July

weather was for the most part favorable for survey work although local heavy rainfalls stopped traffic on all but the main roads. Repeated rains during August and September hindered travel in the northern part of the District.

As an aid to determine the location and amount of aspen and larch defoliation in the District, 2 aerial surveys were undertaken. On the aerial survey of aspen defoliation a distance of 528 miles was travelled. The route of this survey was east from Edmonton to Marwayne, north to Cold Lake, northwest to Lac la Biche, Lyle Lake and the Pelican Mountains, south to Baptiste Lake, southeast to Skeleton Lake, then south and southwest to Figure Lake, Waskatenau and return to Edmonton. On the aerial survey of larch 944 miles were covered. This survey was from Cooking Lake to Fort Chipewyan via Waskatenau, Skeleton Lake, Fort McMurray, Burnt Lakes and the Wabiska River near Wadlin Lake. The return flight was via Big Point on Lake Athabasca, Fort McMurray, the Christina River to Bohn Lake, Grist Lake, Heart Lakes, Beaver Lake, and Elk Island Park to Cooking Lake.

Responsibility for increased defoliation and enlargement of severely defoliated areas of aspen, can be attributed to 3 species of insects in 1960. The most destructive insect was the forest tent caterpillar which has increased in numbers and enlarged its area of activities. A slight increase in the numbers of the leaf-tier Pseudexentera improbana oregonana Wlsh. and Bruce spanworm was evident in the extreme south of the District along Highway 16. Severe defoliation of tamarack, caused by the larch sawfly, occurred in the low lying areas in the north half of the Lac la Biche District. South of Lac la Biche few tamarack occur and defoliation in these stands was classified as light to moderate. The yellow-headed spruce sawfly was found at widely separated locations in the District.

An outbreak of Fomes igniarius, (L. ex Fr.) Kickx, northwest of Calling Lake, was reported. Re-examination of known disease outbreak areas revealed little change from 1959.

TABLE I

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Coniferous Hosts	Insect Colls. Repts.		Disease Colls. Repts.		Deciduous Hosts	Insect Colls. Repts.		Disease Colls. Repts.	
Larch	19	4	4	0	T. aspen	120	53	7	0
Spruce	17	2	2	0	Willow	3	1	0	0
Pine	5	2	5	0	Poplar	2	1	1	0
					Birch	1	0	8	0
Totals	41	8	11	0		126	55	16	0
Collections from Miscellaneous Hosts									12
Grand Total									269

INSECT CONDITIONS

Forest tent caterpillar, Malacosoma disstria Hbn.

The current outbreak of the forest tent caterpillar in the Lac la Biche District, continued to expand in 1960. Larger areas were infested and defoliation was more severe than in 1959. The Elk-Point-Beauvallon outbreak area is now expanded to cover approximately 4,000 square miles. This area is now bounded on the north by Wolf Lake, Spencer Lake and Kinnaird Lake, on the west by Rich

Lake, St. Paul and Morcambe, on the south by Highway 16 from Mannville to Vermillion and on the east by Leighton and Bonnyville. Severe defoliation occurred over most of this area. Moderate defoliation, gradually decreasing to light was evident on the east and west sides of this severe defoliation and to the east continued as far as the Saskatchewan border. On the west a triangle of moderate defoliation occurred from St. Paul and Ranfurly to a point near Rochester. Smaller areas of severe defoliation occurred near Wandering River, Boyle, Ashmont, between Cold Lake and Tucker Lake and along the south shore of Cold Lake extending into Saskatchewan. The heavy infestation, reported in 1959, between Cold Lake and Marie Lake has increased in size and now extends as far west as Tucker Lake. This infestation may join the Elk Point-Beauvallon outbreak and create a larger area of heavy infestation. The small outbreak near Wandering River, reported in 1959, has subsided to the point where very light defoliation occurred in 1960. However, severe defoliation did occur 8 miles southeast of Lyle Lake this year. Low populations occurred in most of the remainder of the District south of Pelican Portage with the exception of a small area north and east of Edmonton where this species of caterpillar was not found. An observation plot was again established at Lac la Biche where data were taken on weather, hatching dates and survival of larvae.

Winn (W)	Not noticeable	Nil	Not noticeable
Brierville	Noticeable	Light	Not noticeable
Wandering River	Noticeable	Light	Not noticeable
(Lyle Lake)			
Beauvallon	Noticeable	Severe	Noticeable
Bonnyville	Noticeable	Severe	Noticeable
Elkscott	Not noticeable	Light	Not noticeable
Cold Lake	Noticeable	Severe	Not noticeable

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1960	Actual Defoliation 1960	Predicted Defoliation for 1961
Lac la Biche	Not noticeable	Nil	Not noticeable
Grassland	Not noticeable	Light	Not noticeable
Calling Lake	Not noticeable	Light	Noticeable
Athabasca R	Not noticeable	Light	Not noticeable
Rochester	Noticeable	Light	Noticeable
Ashmont (S)	Not noticeable	Moderate	Noticeable
Elk Point (N)	Noticeable	Severe	Noticeable
Elk Point (S)	Noticeable	Moderate	Noticeable
Dewberry	Noticeable	Severe	Noticeable
Vermilion (E)	Noticeable	Moderate	Noticeable
Manville (E)	Noticeable	Light	Noticeable
Two Hills (S)	Not noticeable	Moderate	Noticeable
Andrew	Not noticeable	Light	Not noticeable
Star (N)	- - -	Light	Not noticeable
Warspite	Not noticeable	Moderate	Not noticeable
Vilna (W)	Not noticeable	Nil	Not noticeable
Brierville	Noticeable	Light	Not noticeable
Wandering River (Lyle Lake)	Noticeable	Light	Not noticeable
Beauvallon	Noticeable	Severe	Noticeable
Bonnyville	Noticeable	Severe	Noticeable
Ellscott	Not noticeable	Light	Not noticeable
Cold Lake	Noticeable	Severe	Not noticeable

Larch sawfly, Pristiphora erichsonii (Htg.)

Light to moderate defoliation of larch by this insect occurred in that part of the District lying south of Lac la Biche. North of Lac la Biche, where larch trees are more plentiful, severe defoliation occurred. This severe defoliation continued as far north as Lake Athabasca and occurred east of Lyle Lake, along Wandering River, in the House and Hangingstone River flats, along the south sides of Birch River and Claire Lake, around Richardson Lake and in the valleys of the Marguerite, Firebag, Muskeg, Steepbank, Clearwater, Christina and Sand Rivers. Much of the larch in this area is scattered and growing in mixed stands with spruce. Small pure stands of larch along the Christina River north of Winnifred Lake and near Ipiatik Lake were also severely defoliated. Most of the stands reported in 1959 as having unusually short needle growth, show a further decline in tree vigor. In many instances the trees did not produce needle growth this season and appear to be dead.

Sequential sampling at 4 of the 5 permanent sample stations in the District was completed and data gathered to determine the infestation classes. Because of retarded growth, one sample station was abandoned this year.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station Number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960
5-1	Calling Lake	Medium	Medium	Nil
5-2	Perryvale	Light	Heavy	Light
5-4	Cold Lake	Light	Light	Nil
5-5	Lac la Biche	Medium	Light	Nil

Aspen defoliators, Pseudexentera improbana oregonana Wlsh., Choristoneura conflictana (Wlk.), Operophtera bruceata (Hbst) and Compsolechia niveo-pulvella Cham.

Larvae of these insects were responsible for the increase in defoliation of aspen which occurred in the southwest corner of the District and along Highway 16. P. improbana oregonana was primarily responsible for the defoliation other than in a small area near Islay where there was a high population of O. bruceata. Moderate defoliation occurred south of a line from Legal to Lloydminster and north of Highway 16 except in a triangular area between Campbell Lake, Borradaile and Kitscoty. In this latter area severe defoliation occurred. East of Kitscoty defoliation gradually decreased to light at Lloydminster. Traces of defoliation attributable to these insects were found at widely separated locations throughout the remainder of the District.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

A further decline in the numbers of this insect in the Lac la Biche District was evident in 1960. Insignificant numbers of larvae were found on a few widely separated shelterbelts. Southeast of Athabasca severe defoliation occurred on a few trees in a white spruce plantation. A black spruce, the only one of this species in the plantation, also suffered severe defoliation. The only other severe defoliation of spruce occurred north of Newbrook where a small native stand of regeneration black spruce sustained severe defoliation in the upper quarter of the crowns. The application of chemical sprays to shelterbelts appears to be keeping this pest under control.

Prairie tent caterpillar, Malacosoma lutescens (N. & D.)

Very little evidence of this caterpillar was found in the Lac la Biche District in 1960. Light populations were found near Dewberry, Beauvallon and Lindbergh. The largest infestation was found near Lindbergh where numerous larvae and small tents were found scattered over an area of about 160 acres. Light damage occurred on the principal hosts, wild rose and chokecherry.

Scale, <u>Aspidiotus popularis</u> (Harlett)	0	T. aspen	Active in the 2 areas reported in 1959.
Twice-stabbed lady beetle, <u>Chilocorus stigma</u> Say	4	T. aspen	Collected in the 2 areas infested with <u>Aspidiotus popularis</u> .
Gall mite, <u>Eriophyes</u>	2	T. aspen	A noticeable decline in affected leaves this year.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	23	T. aspen	A decline in the numbers of these beetles was evident in 1960.
American aspen beetle, <u>Conioctenus americanus</u> (Mason)	2	T. aspen	Very little defoliation of aspen could be attributed to these beetles.
Striped alder sawfly, <u>Hamichroa groceus</u> Geoffroy.	1	Alder	A small population found 2 miles north of Wandering River Post Office.
Pitch nodule maker, <u>Petrova</u> sp.	2	J. pine	Low populations active where regeneration pine occurs.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hook.	1	N. spruce	A decline in damage was evident.

TABLE IV

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE IAC LA BICHE DISTRICT, 1960)

Insect Species	Number of collections	Host	Remarks
Scale, <u>Aspidiotus popularum</u> (Marlatt)	0	T. aspen	Active in the 2 areas reported in 1959.
Twice-stabbed lady beetle, <u>Chilocorus stigma</u> Say	4	T. aspen	Collected in the 2 areas infested with <u>Aspidiotus popularum</u> .
Gall mite, <u>Eriophyidae</u>	2	T. aspen	A noticeable decline in affected leaves this year.
Grey willow leaf beetle, <u>Galerucella decora</u> Say	13	T. aspen	A decline in the numbers of these beetles was evident in 1960.
American aspen beetle, <u>Gonioctena americana</u> (Schaeff.)	16	T. aspen	Very little defoliation of aspen could be attributed to these beetles.
Striped alder sawfly, <u>Hemichroa crocea</u> Geoffroy.	1	Alder	A small population found 2 miles north of Wandering River Post Office.
Pitch nodule maker, <u>Petrova</u> sp.	2	J. pine	Low populations active where regeneration pine occurs.
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	3	W. spruce	A decline in damage was evident.

DISEASE CONDITIONS

Fomes igniarius (L. ex Fr.) Kickx

An outbreak of Fomes igniarius not previously recorded has been responsible for severe damage to aspen over a 700 square mile area between Calling Lake and Rock Island Lake. This infection is in a mixed stand of mature aspen and spruce trees and may be larger than reported. Because of restricted travel conditions a full survey of the outbreak could not be accomplished at this time. In the area surveyed an estimated 80 per cent of the aspen was affected. Fruiting bodies of this causal agent were also found on birch.

Sclerotium confundens Whetz.

Re-examination of the outbreak of this disease in the Lac la Biche area revealed a decrease in the degree of infection from that which occurred in 1959. It was estimated that 8 per cent of the crowns on 10 per cent of the aspen in a 750 square mile area were affected this year.

Arceuthobium americanum Nutt. ex Engelm.

During the aerial survey in the northern part of the District the presence of dwarf mistletoe on Jackpine was recorded in 3 separate areas. The smallest infected area was found near Claire Lake where numerous brooms were visible over an area of about 9 square miles. This stand is composed of fire residual mature trees. The other infected areas were each about 70 miles in length. One occurred between the 26th. and 28th. base lines a few miles east of Richardson Lake, the other from a few miles east of Grist Lake to the junction of the Winefred and Christina Rivers. Witches brooms were visible throughout these areas wherever mature trees were present. Walrothiella arceuthobii (PK.) Sacc. was found infecting aerial plants in the Fort Chipewyan area. This hyper-parasite had not previously been reported from this area.

TABLE V

SUMMARY OF RECORDED DISEASE OUTBREAKS
ACTIVE IN THE LAC LA BICHE DISTRICT IN
1960

Outbreak number	Location	Causal Organism	Remarks
5-4	Bellis	<u>Arceuthobium americanum</u> Nutt. ex Engelm	Re-examination. <u>Walrothiella</u> <u>arceuthobii</u> (PK.) Sacc. infection on aerial plants.
5-5	Lac la Biche	<u>Sclerotium confundens</u> Whetz.	Re-examination. Degree of infection lower than in 1959.
5-6	Calling Lake	<u>Fomes igniarius</u> (L. ex Fr.) Kickx	Approximately 700 square miles infected. A newly recorded outbreak.

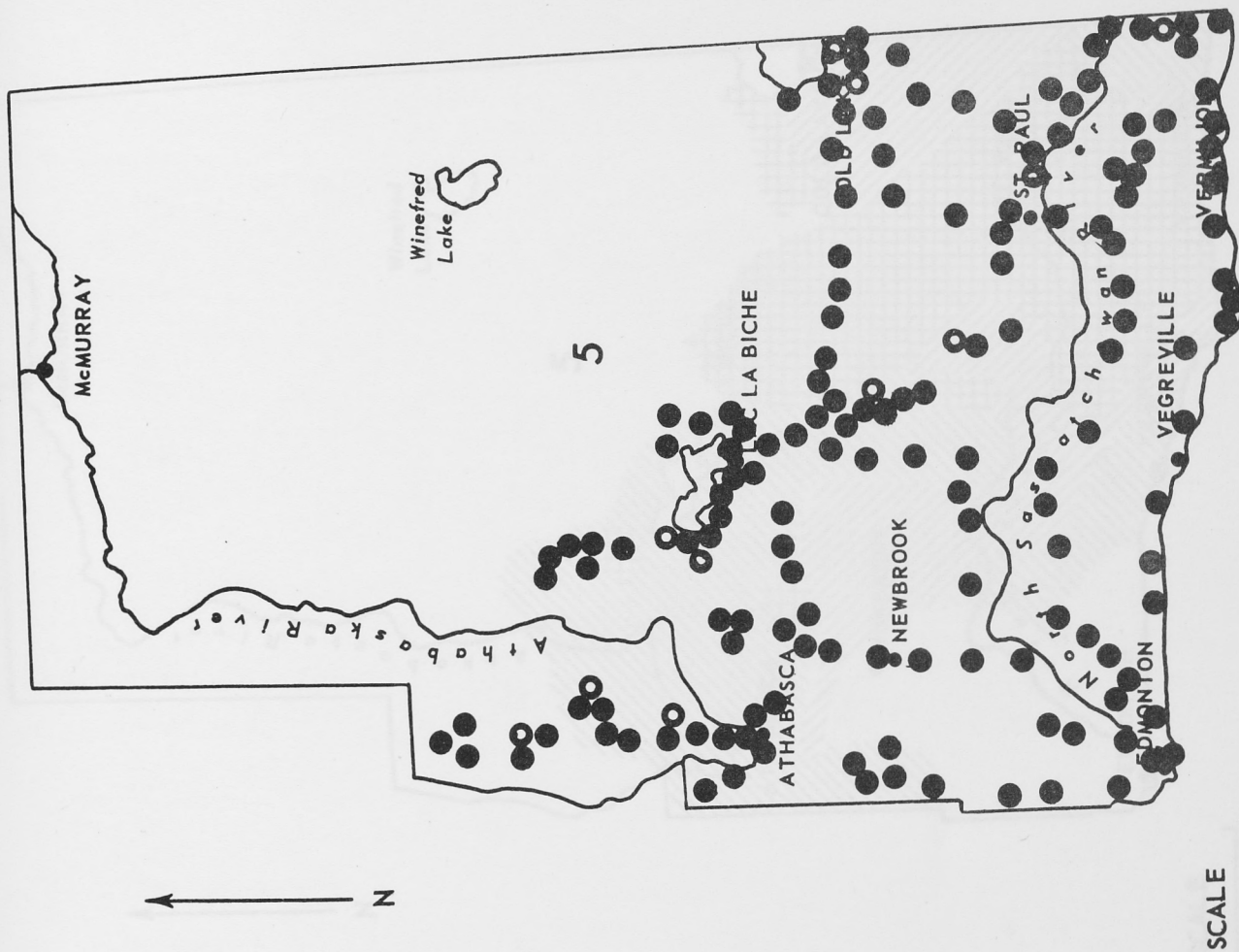
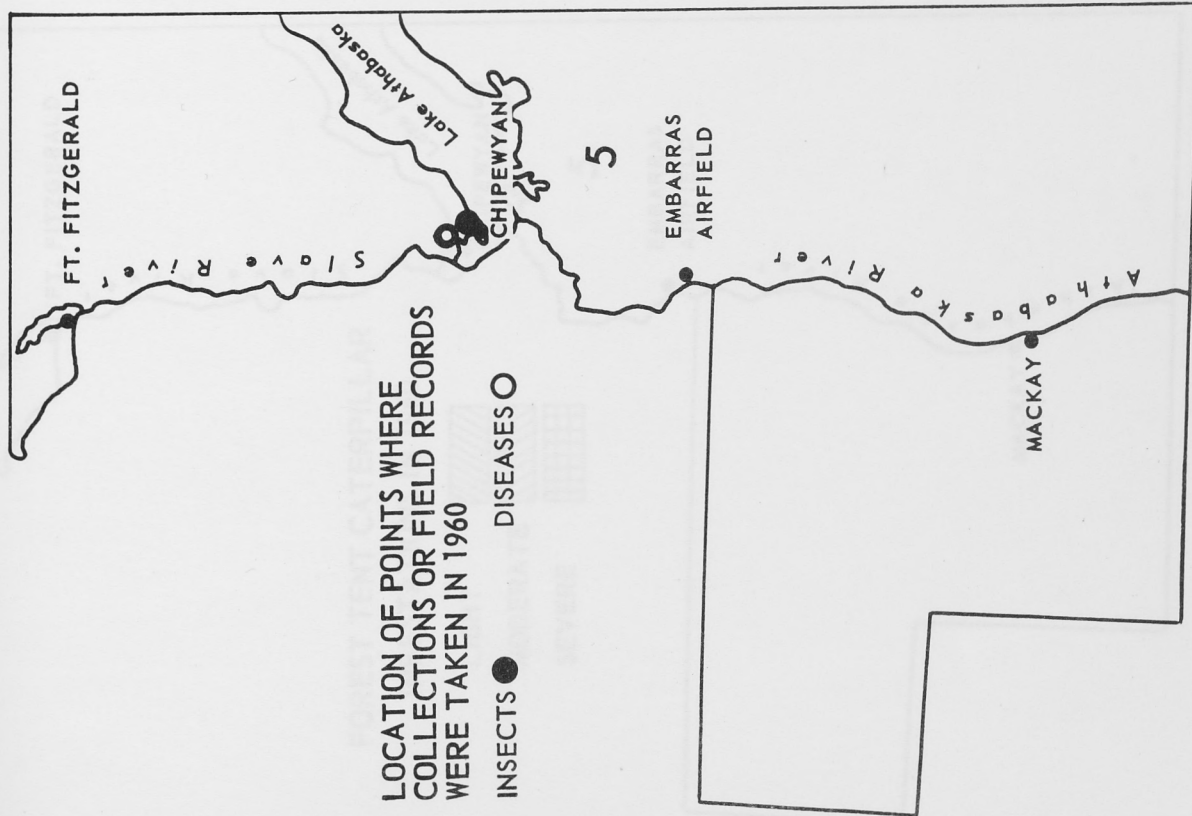
TABLE VI
SUMMARY OF DISEASE COLLECTIONS

Causal Agent	Host	Location	Remarks
<u>Agaricaceae</u>	Alder	Athabasca	Infecting mature trees over a small area.
<u>Arceuthobium americanum</u> Nutt. ex Engelm.	J. pine	Lindbergh Cold Lake	A small area infected.
<u>Chrysomyxa ledicola</u> Lagerh.	W. spruce	Calling Lake	Small isolated outbreaks.
<u>Cronartium commandrae</u> Pk.	J. pine	Grand Centre	Very little of this disease found in this District.
<u>Fomes applanatus</u> (Pers. ex Walr.) Gill.	T. aspen	Plamondin	Found fruiting on a decorticated log.
<u>Fomes fomentarius</u> (L. ex Fr.) Kickx	Birch	Fort Chipewyan Athabasca Plamondin	Numerous conks on dead trees.
<u>Fomes igniarius</u> (L. ex Fr.) Kickx	T. aspen	Calling Lake Plamondin	A very large area infected. Outbreak #5-6.
<u>Fomes igniarius</u> (L. ex Fr.) Kickx	Birch	Plamondin	Found fruiting on living trees of a mixed aspen and birch stand.
<u>Fomes pinicola</u> (Sw. ex Fr.) Cke.	W. spruce	Plamondin	Fruiting on dead broken off trees in a small area.
<u>Fomes subroseus</u> (Weir) Overh.	Tamarack	Grande Centre	Found infecting a small stand.
<u>Gymnosporangium clavipes</u> Cke. and Pk.	Saskatoon	Fort Chipewyan	A severe infection in a small area.
<u>Hericium coralloides</u> Leers ex Banker	B. poplar	Calling Lake	Collected at one location only.

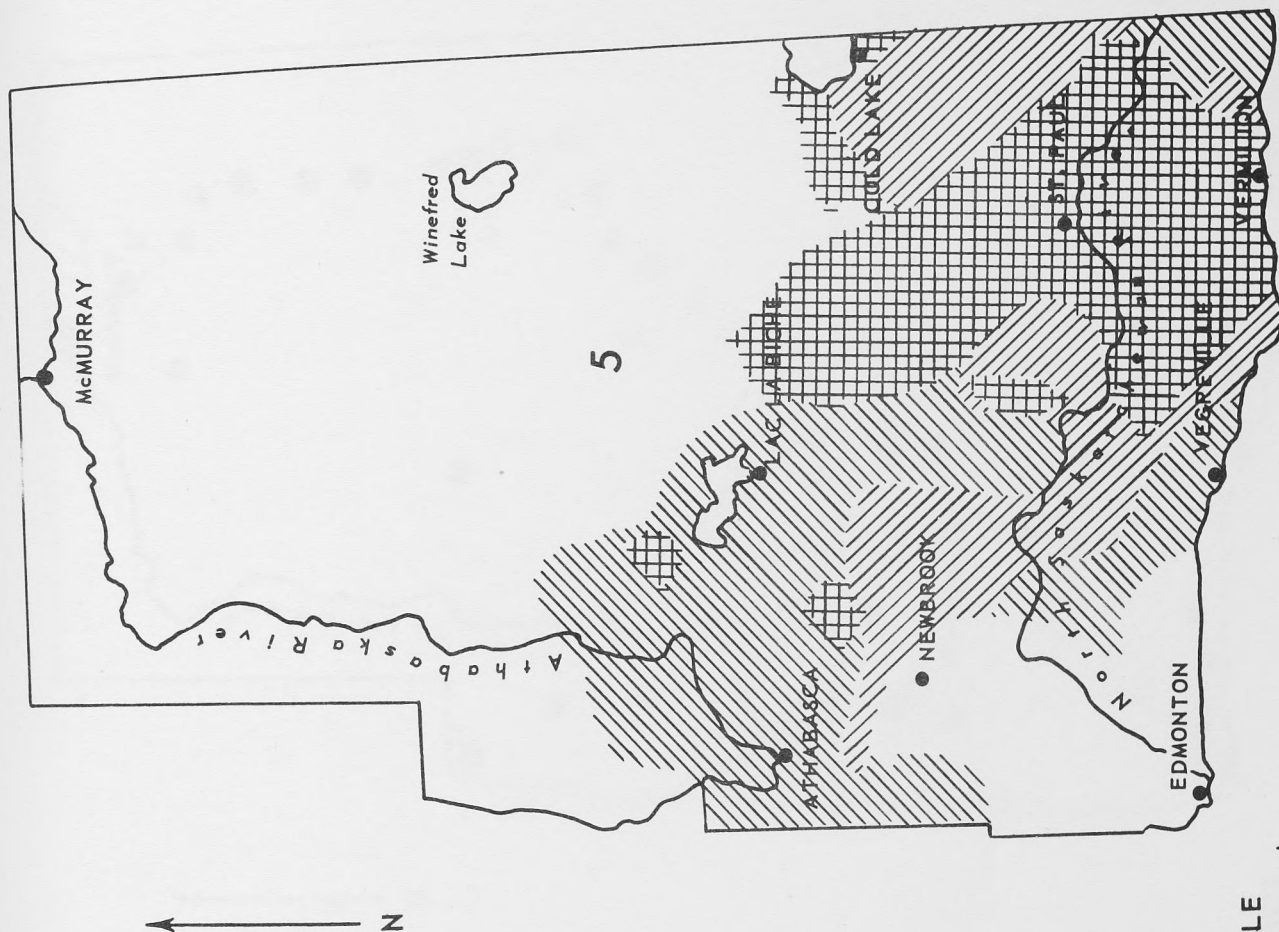
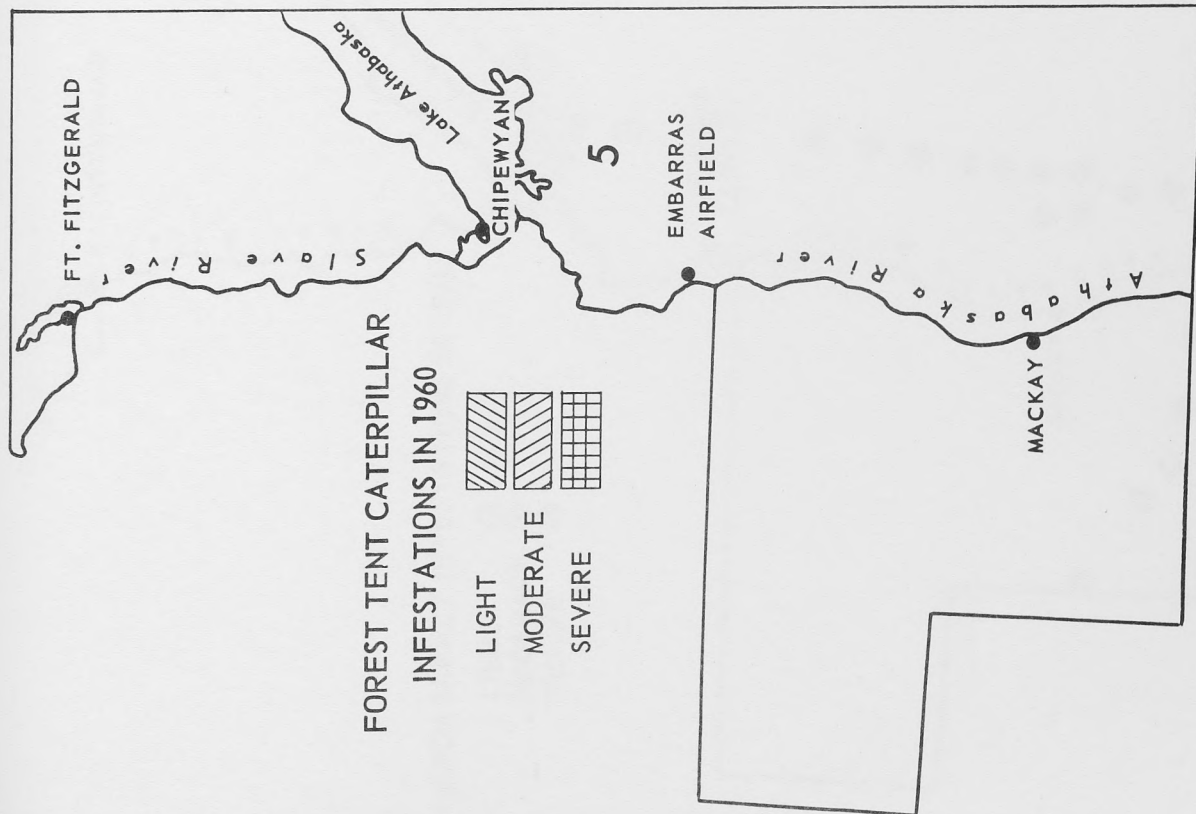
TABLE VI

SUMMARY OF DISEASE COLLECTIONS cont'd.

Causal Agent	Host	Location	Remarks
<u>Hypoxylon pruinatum</u> (Klotzsche) Cke.	T. aspen	Spedden	Occurs sporadically throughout the District.
<u>Lenzites betulina</u> (L. ex Fr.) Fr.	Birch	Athabasca	Found at one location only, fruiting on fallen trees.
<u>Lenzites saepiaria</u> (Wulf. ex Fr.) Fr.	Tamarack	Grand Centre	Found infecting a small stand.
<u>Marssonina tremuloidis</u> Kleb.	T. aspen	Lloydminster Ashmont Fort Chipewyan	Observed infecting small areas.
<u>Peridermium harknessii</u> Moore	J. pine	Lindbergh	Very little in this area.
<u>Polyporus abietinus</u> Dicks. ex Fr.	Tamarack	Grand Centre	Found infecting a small stand.
<u>Polyporus betulinus</u> Bull. ex Fr.	Birch	Calling Lake	Numerous conks on dead trees.
<u>Polyporus hirsutus</u> Wulf. ex Fr.	Birch	Athabasca	Found at one location only, fruiting on fallen trees.
<u>Stereum</u> sp.	Birch	Athabasca	Found at one location only, fruiting on fallen trees.
<u>Tremellales</u>	Tamarack	Grand Centre	Found infecting a small stand.
<u>Walrothiella arceuthobii</u> (Pk.) Sacc.	D. mistletoe	Fort Chipewyan	This hyper-parasite was not found on all plants.



LAC LA BICHE DISTRICT

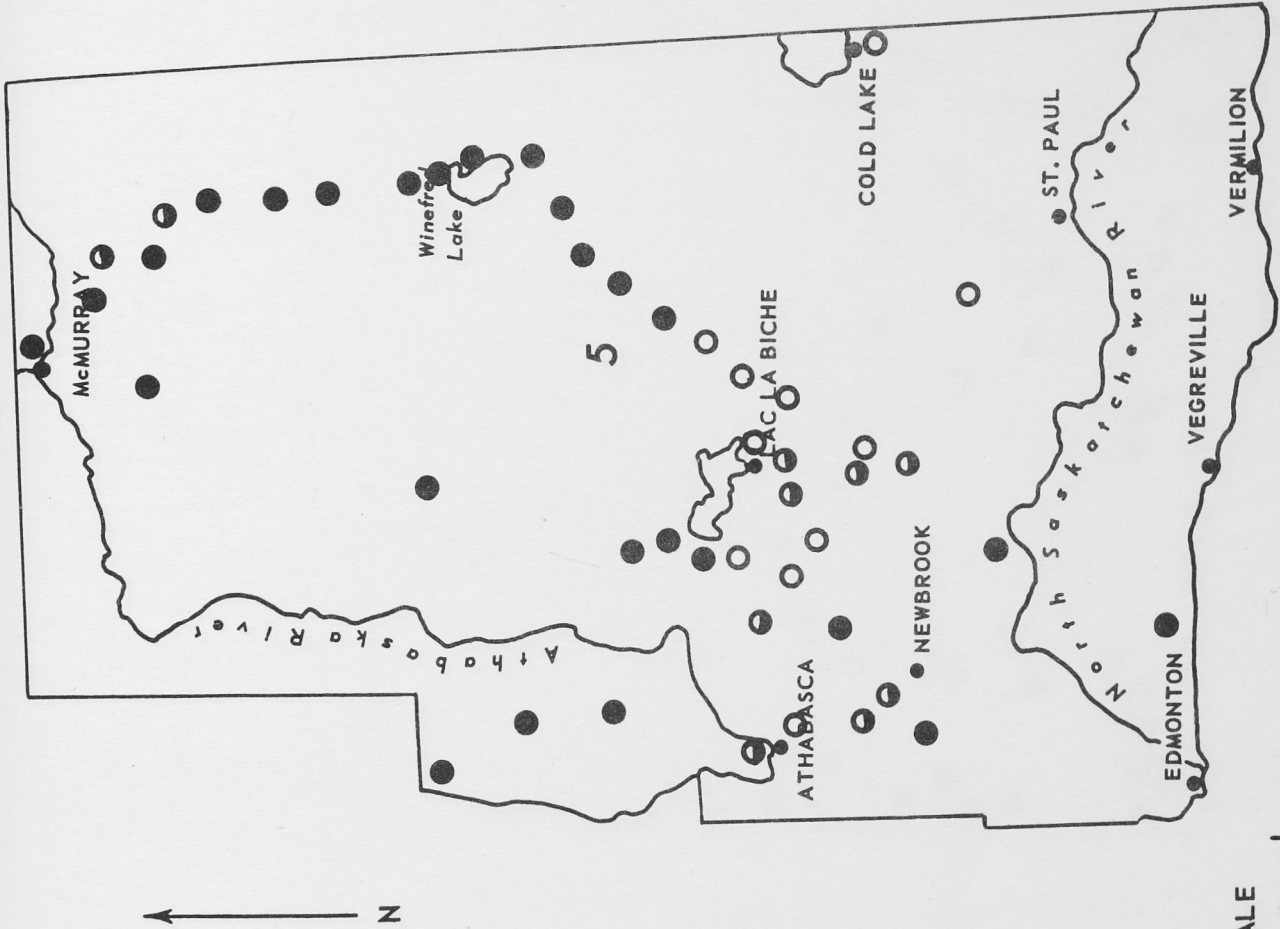
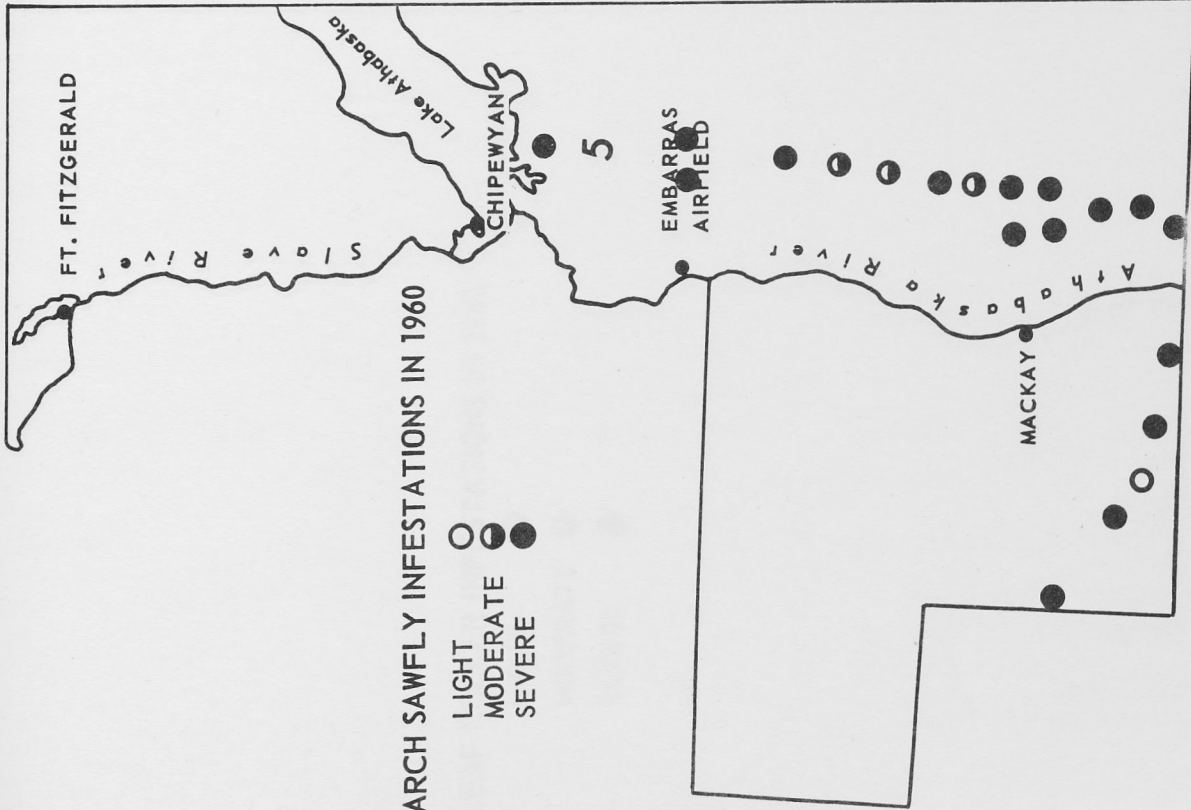


SCALE
0 35 MILES

LAC LA BICHE DISTRICT

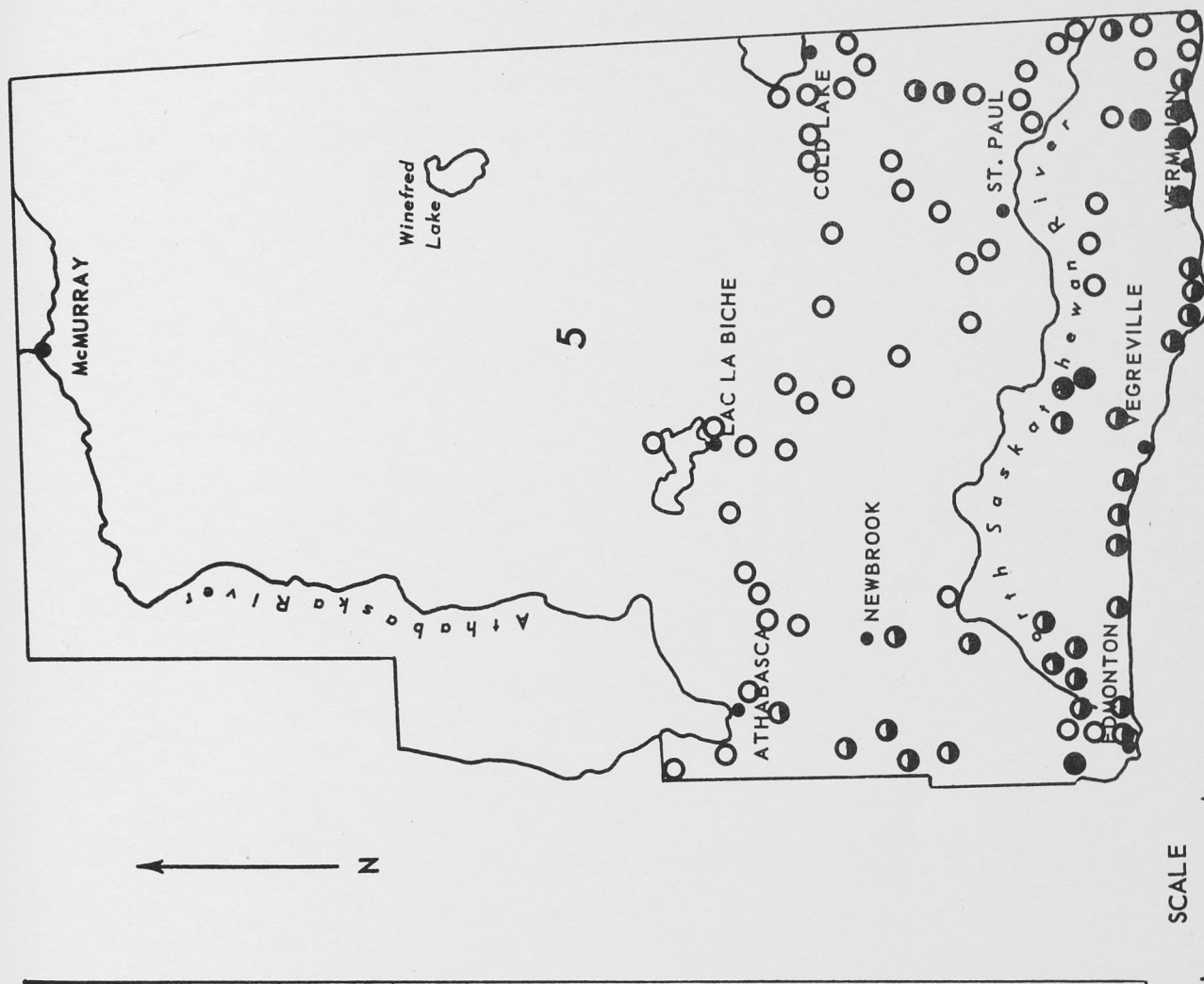
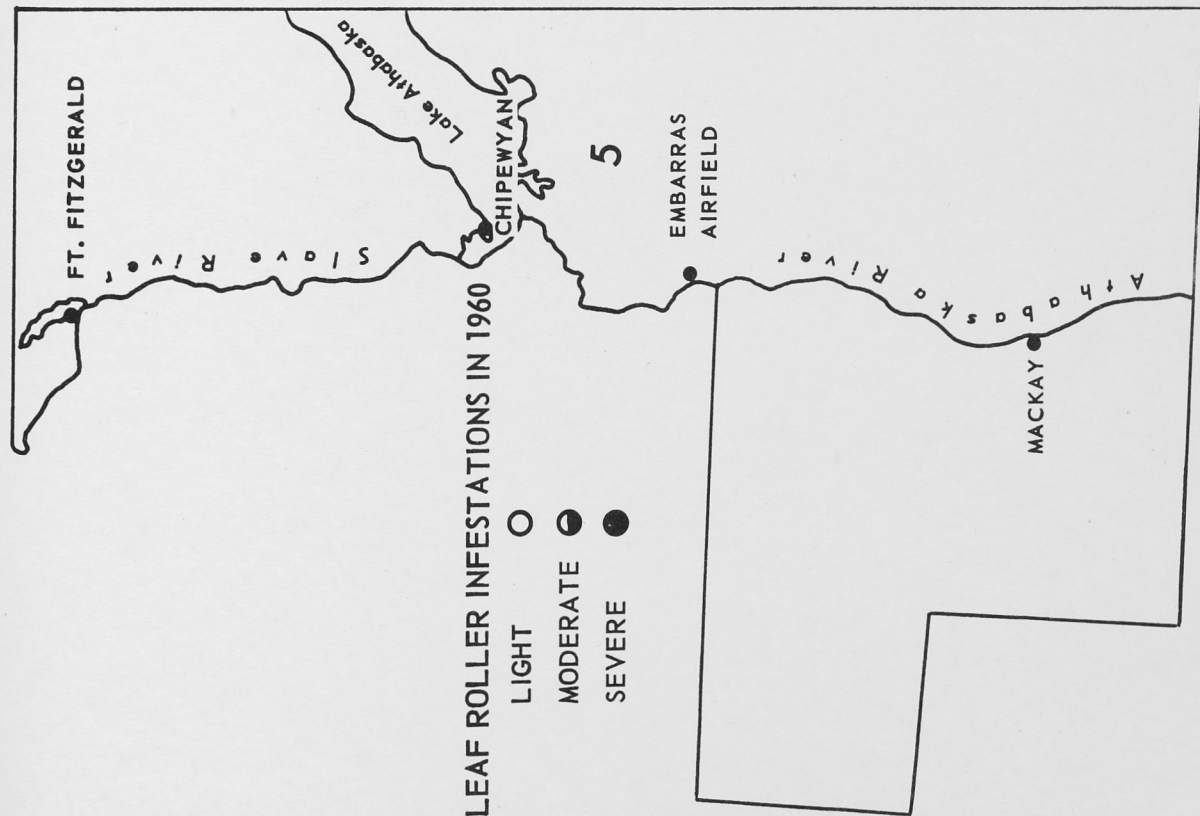
LARCH SAWFLY INFESTATIONS IN 1960

- LIGHT ○
- MODERATE ◐
- SEVERE ●



SCALE
0 35 MILES

LAC LA BICHE DISTRICT



FOREST BIOLOGY RANGER REPORT
GRANDE PRAIRIE - SLAVE LAKE DISTRICT
ALBERTA 1960

by
F. J. EMOND
FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY
CALGARY, ALBERTA

CANADA DEPARTMENT OF FORESTRY
FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
MARCH 1961

INTRODUCTION

The field season in the Grande Prairie - Slave Lake District started May 23 and ended September 16. During this period 10,677 miles were travelled by vehicle and 1,100 miles travelled by aircraft.

General weather and road conditions during the survey season were for the most part favourable. The only exception was during the early part of the season when excessive rains closed the forestry roads south of Grande Prairie.

Two aerial surveys were conducted in District 6 during the field season. One for aspen defoliation on July 7 and another for larch sawfly damage on September 8.

Other special projects and investigations carried out during the season included: sequential sampling of aspen for forest tent caterpillar egg masses, sequential sampling of 4 permanent larch sawfly plots, mass collections of larvae and cocoons of the forest tent caterpillar for parasite studies, the re-examination of 2 pine phenology plots established during the previous season, a collection of 50 forest tent caterpillar egg bands for egg emergence studies from each of 13 different locations, and the annual examination of Forestry Branch spruce seed plots.

Prior to the field season work was completed on fibre-glassing the hull of the survey boat Borealis, at Seebe. Post season work consisted of the building of a pan-abode cabin at Grande Prairie for District 6 headquarters.

Aspen defoliators were again active throughout the District during the 1960 field season. Three species of insects were mainly responsible. These were the forest tent caterpillar, the large aspen tortrix, and a leaf-tier, Pseudexentera improbana oregonana Wlsh. The forest tent caterpillar was largely responsible for aspen defoliation in the Sturgeon Lake, Joussard, Grande Prairie and Wanham areas. The leaf-tier, P. improbana oregonana, was responsible for damage in the Valleyview, Triangle and Wembley areas. The large aspen tortrix combined with the forest tent caterpillar caused moderate to heavy defoliation in the Smith and Fawcett Lake areas.

Defoliation of a larch was again prevalent throughout the eastern half of the District with moderate to severe damage occurring in most areas where larch occurs. In the western half of the District populations remained low and damage negligible.

A running canker on pine, Atropellis piniphila (Weir) Lohman & Cash, was found to be well established in the lodgepole pine stands south of Grande Prairie. A stem rust, Peridermium harknessii Moore, was reported from the same general area. A needle rust of spruce, Chrysomyxa sp. was present in many of the spruce stands inspected throughout the District.

TABLE I.

SUMMARY OF INSECT AND DISEASE COLLECTIONS
AND REPORTS BY HOST TREES

Con- iferous Hosts	Insect		Disease		Deciduous Hosts	Insect		Disease	
	Colls.	Repts.	Colls.	Repts.		Colls.	Repts.	Colls.	Repts.
Spruce	34	18	6	6	T. aspen	76	57	4	3
Pine	20	1	14	3	Poplar	12	2	2	0
Larch	14	12	0	0	Willow	15	2	0	0
Fir	4	0	0	0	Alder	8	5	0	0
	—	—	—	—		—	—	—	—
TOTALS	72	31	20	9		111	66	6	3
Collections from Miscellaneous Hosts									22
GRAND TOTAL									340

INSECT CONDITIONS

Forest Tent Caterpillar, Malacosma disstria Hbn.

Defoliation of aspen by this species of tent caterpillar showed a definite decline during the 1960 season. This decline is believed due to the wet and unusually cold weather which occurred during the larval emergence period. While defoliation in some areas subsided, larva populations remained approximately the same as in the previous season, but were more widely distributed throughout the District.

Moderate to severe defoliation was experienced in the Valleyview, Sturgeon Heights and Crooked Creek areas. The area surrounding Sturgeon Lake was completely stripped of aspen foliage and in some instances the majority of the understory of rose, cranberry and saskatoon was also defoliated. Other small pockets of severe defoliation were noted south of Sturgeon Lake, south of Goodwin, Wanham, Joussard, Fawcett Lake, and north of Debolt. From Goodwin west to Grande Prairie light to moderate defoliation was evident. This condition also prevailed in small areas around Smith, Beaverlodge, High Prairie, south of Grande Prairie and south of Valleyview to the Little Smoky river. Elsewhere throughout the District population levels were low.

TABLE II
RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1960	Actual Defoliation 1960	Predicated Defoliation for 1961
Debolt	Not noticeable	Moderate	Noticeable
Sturgeon Lake	Noticeable	Moderate	Noticeable
High Prairie	Not noticeable	Nil	Not noticeable
Driftpile	Not noticeable	Light	Not noticeable
Slave Lake	Not noticeable	Nil	Not noticeable
Fawcett Lake	Noticeable	Heavy	Not noticeable
Huallen	Not noticeable	Light	Not noticeable
Baytree	Not noticeable	Nil	Not noticeable
Spirit River	Not noticeable	Nil	Not noticeable
Tangent	Not noticeable	Nil	Not noticeable
Grovedale	Noticeable	Nil	Noticeable

Larch Sawfly, Pristiphora erichsonii (Htg.)

Defoliation of tamarack by this species of sawfly remained much the same as in the previous season with the exception of the area between Fawcett Lake and Lesser Slave Lake where defoliation increased to the severe category. A slight increase in defoliation was also noted south of High Prairie.

Light to moderate defoliation was recorded in the Canyon Creek, Smith, Flatbush and Fawcett areas intermixed with small patches of severe defoliation.

An aerial survey was carried out during the first week of September in the Loon, Chipewyan, Peerless, Wabasca and Fawcett lakes areas to map the damage done by this species north of Lesser Slave Lake. Light to moderate damage was evident over most of the area covered with the exception of a few small, widely scattered severe infestations.

Elsewhere throughout the District population levels of this sawfly were light and damage negligible.

TABLE III
RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station Number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960
6 - 1	Grande Prairie	Light	Light	Light
6 - 2	Flatbush	Moderate	Moderate	Moderate
6 - 3	Slave Lake	Moderate	Moderate	Moderate
6 - 4	Grouard	Light	Light	Light

A leaf tier, Pseudexentera improbana oregonana Wlsh.

Considerable damage to aspen by this species was evident in the western half of the District. High populations of larvae were reported from Wembley, Woking, Wanham and Valleyview and south of Grande Prairie. Medium populations were recorded at Baytree, Beaverlodge, Blueberry Mountain and Watino. In the eastern half of the District the only area affected to any extent was from Smith south to Jarvie where light to moderate damage occurred.

Large aspen tortrix, Choristoneura conflictana (Wlk.)

A small outbreak of this species reported during 1959 in the vicinity of Smith, was still very much in evidence in 1960. Medium to high populations of larvae were found for a distance of approximately 2 to 3 miles along Highway 2 northwest of Smith. Low populations of larvae were also noted in the aspen stands along the southwest shore of Fawcett Lake but no damage was observed.

It is difficult to determine the amount of damage caused by this particular species due to the feeding of the forest tent caterpillar in the same area.

Spruce gall aphids, Adelges spp.

A general increase in the number of galls caused by this species was noted during the 1960 field season.

Heavy concentrations of galls were noted in and around the following centres; Grande Prairie, Wembley and Beaverlodge. At the Beaverlodge Experimental Farm one shelterbelt of spruce was very heavily affected and considerable damage was evident on the new growth.

Elsewhere throughout the District damage by these aphids remained in the light to moderate category.

Poplar serpentine miner, Phylloconistis populiella Cham.

Mining of both trembling aspen and balsam poplar leaves by this species was noted in varying degrees of intensity throughout the majority of aspen and poplar stands inspected in the District.

Moderate to severe damage, confined to small areas, was noted south of Grande Prairie in the vicinity of Rat Creek and also south of Goodwin around Economy Tower. Although this leaf miner was present in the remainder of the District population levels were low and damage was light.

Grey willow leaf beetle, Galerucella decora Say

A small outbreak of this leaf eating beetle was reported in the vicinity of the Little Smoky bridge south of Valleyview. Regeneration aspen and willow were heavily affected over an area of approximately 10 acres.

Western tent caterpillar, Malacosoma pluviale (Dyar)

Larval populations of this tent caterpillar showed a slight increase over the previous season.

Rose continued to sustain the heaviest defoliation although saskatoon and raspberry were also affected. In the western half of the District the most of the damage was in the areas adjacent to Saskatoon Lake, Wanham, Rycroft and Spirit River. In the eastern half of the District light damage was recorded around Fawcett Lake, Flatbush, Smith and Jarvie.

Alder leaf miner, Gracilariidae

Larvae of this species caused considerable discoloration to alder stands throughout the District. Heavy concentrations of larvae were recorded in the following areas; along the Little Smoky River 12 miles south of Triangle, 8 miles south of Goodwin along the Simonette River, north of Smith and 2 miles north of Grouard. Light populations were noted wherever alder occurred in substantial quantities in the remainder of the District.

American aspen beetle, Gonioctena americana (Schaeff.)

A small outbreak of this species was found defoliating regeneration aspen in an area of approximately 3 acres along the Smith - Fawcett Lake road. Elsewhere throughout the District low populations were noted and damage was light.

TABLE IV

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE GRANDE PRAIRIE-SLAVE LAKE
DISTRICT, 1960)

Insect species	Number of collections	Host(s)	Remarks
Aphids	4	Ash Larch Poplar	Fairly common on these hosts throughout the District.
A needle miner, <u>Argyrotaenia tabulana</u> Free	1	J. pine	Located south of Grande Prairie on regeneration pine.
Leaf beetles, <u>Chrysomelidae</u>	6	Willow Dogwood B. poplar	Found at various locations, no serious damage.
A gall mite, <u>Eriophyidae</u>	2	T. aspen	Scattered throughout the District, a noticeable increase.
Pine root weevil, <u>Hylobius</u> sp.	2	Lp. pine	Well established in the pine stands south of Grande Prairie.
A looper, <u>Itame loricaria</u> Evers.	8	T. aspen	Associated in various numbers with other aspen defoliators.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	6	W. spruce	Reported mainly on shade and shelterbelt trees.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	8	T. aspen	Noticeable decrease in populations in 1960.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	8	W. spruce	Reported from both native and shelterbelt trees.
Poplar gall aphids, <u>Pemphigus</u> spp.	7	B. poplar	Fairly common in the District.
Pitch nodule maker, <u>Petrova</u> sp.	4	Lp. pine J. pine	Common in regeneration pine
A. weevil, <u>Pissodes</u> sp.	3	W. spruce	Light populations throughout the district.
Bark beetles, <u>Scolytidae</u>	5	W. spruce	Found mostly on slash and downed trees.

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DISEASE CONDITIONS

Canker of pine, Atropellis piniphila (Weir) Lohman and Cash.

Two new areas affected by this canker in probable outbreak proportions were reported during 1960. One area was situated along the forestry road south of Grande Prairie on the Nose Mountain cutoff, the other in the Two Lakes region south of the Wapiti settlement. Both of these areas were heavily infected and in some instances 60 per cent of the trees inspected showed evidence of this canker.

Lighter infections by this organism were noted south of Goodwin as far as the Simonette Tower and also in the vicinity of Kakwa Tower south of Grande Prairie.

Stem rust of pine, Peridermium harknessii Moore

Rust galls on lodgepole pine, caused by this rust fungus were found at the following locations; 80 miles south of Goodwin in the vicinity of Simonette Tower, 75 miles south of Wapiti Settlement, 18 miles south of Grovedale, 12 miles north of Sexsmith in the Burnt Hills and one mile east of the Alberta - British Columbia boundary along Highway 2.

Needle rust on spruce, Chrysomyxa sp.

Moderate to severe damage to spruce foliage caused by this rust was noted 4 miles southeast of Slave Lake, 70 miles south of Goodwin and 35 miles south of Wapiti Settlement along the Two Lakes road.

Throughout the remainder of the District light to moderate rust conditions prevailed in the majority of the spruce stands examined.

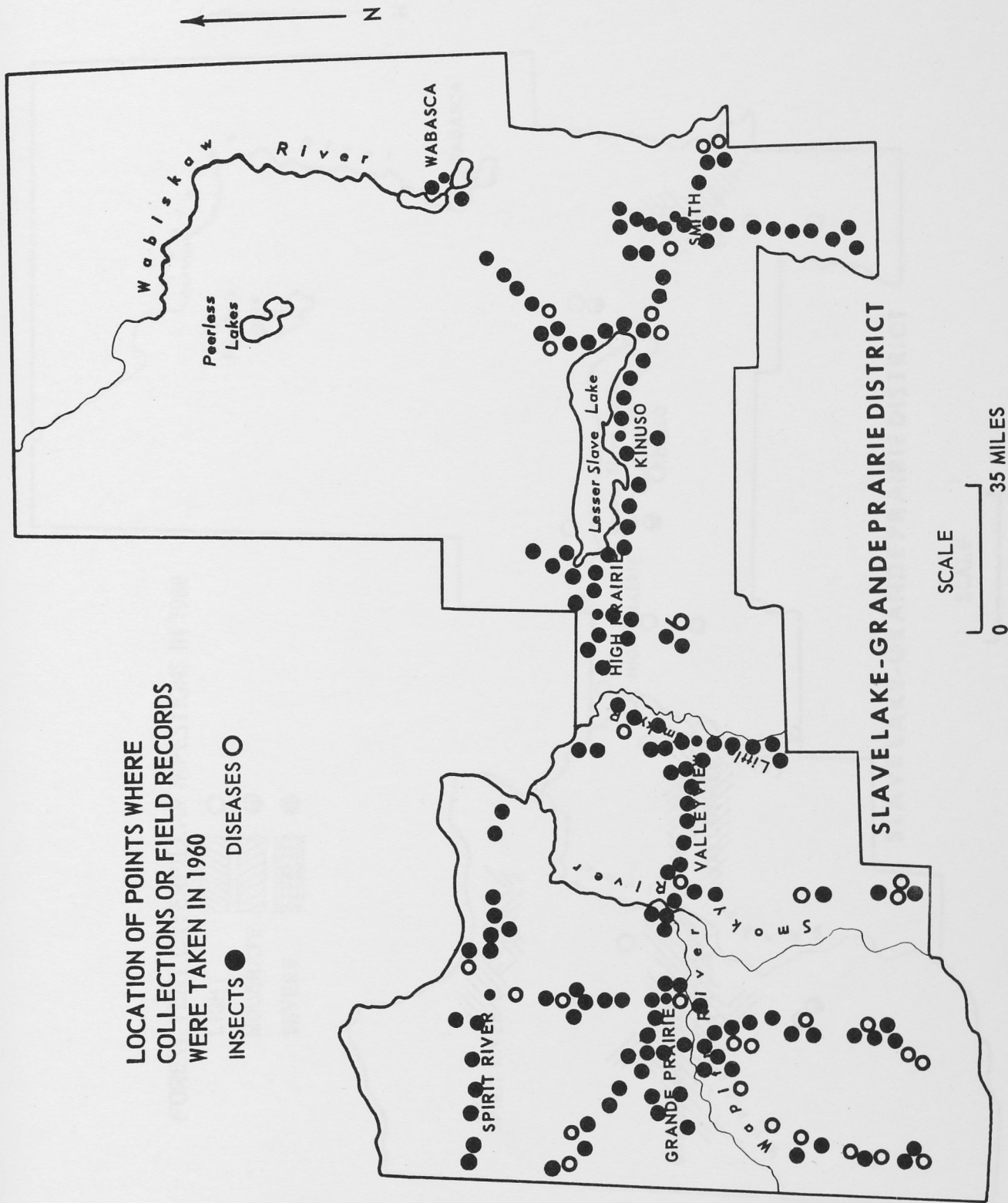
TABLE V

SUMMARY OF DISEASE COLLECTIONS

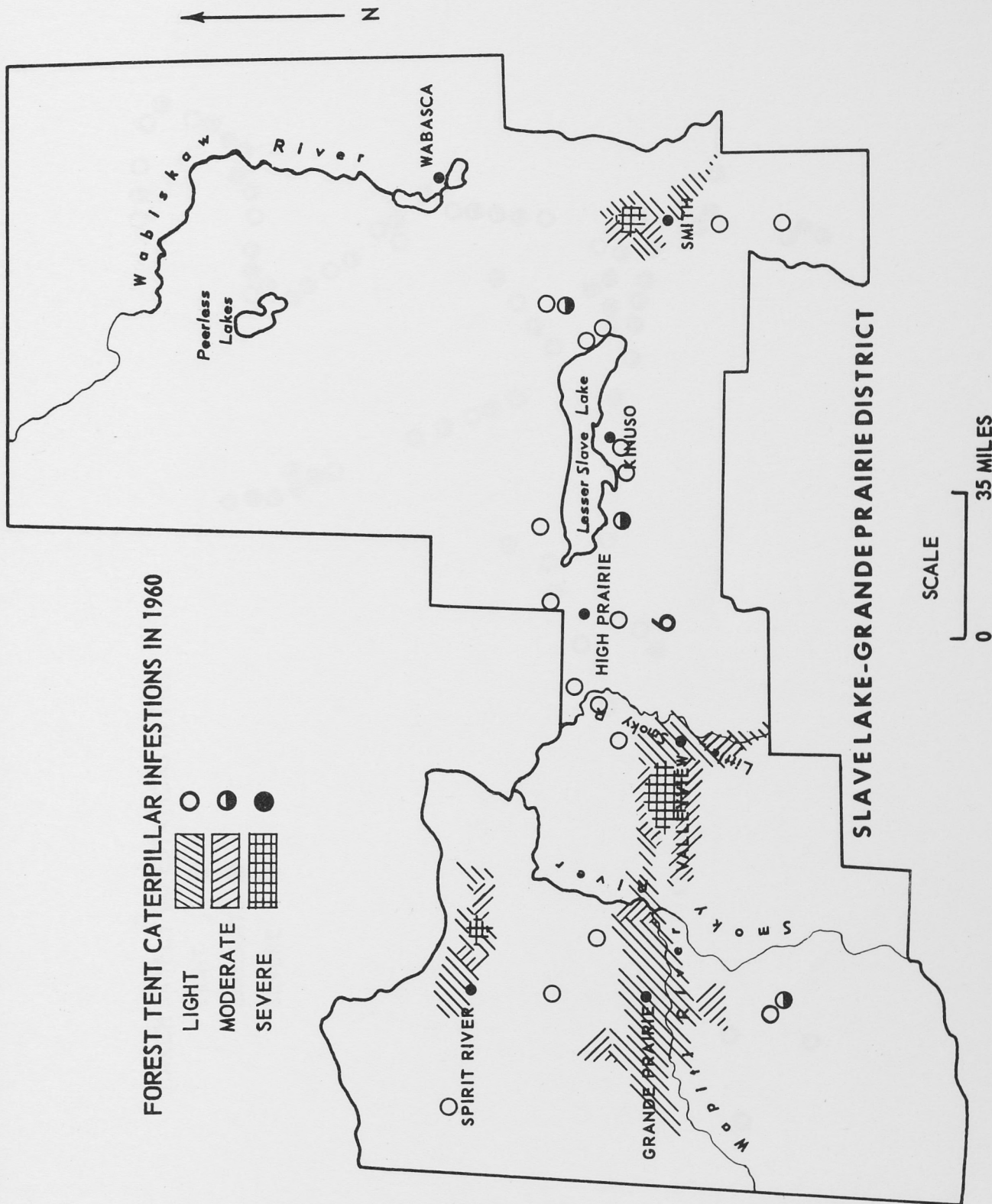
Causal Agent	Host	Location	Remarks
<u>Arceuthobium americanum</u> Nutt. ex Engelm.	J. pine	Grande Prairie	Dwarf mistletoe on living trees.
<u>Atropellis piniphila</u> (Weir) Lohman & Cash	Lp. pine	Wapiti Goodwin Grande Prairie	Running canker on pine.
<u>Chrysomyxa ledi</u> de Bary	W. spruce	Slave Lake Grovedale Grande Prairie	Needle rust.
<u>Chrysomyxa ledicola</u> Lagerh	W. spruce	Wabiskaw Trail	Needle rust.
Clumping of aspen	T. aspen	Rycroft	Climatic injury.
<u>Corticium polygonium</u> (Pers. ex Fr.) Fr.	T. aspen	Grovedale	White trunk rot.
<u>Peridermium harknessii</u> Moore	Lp. pine	Goodwin Wapiti Grovedale Woking Demmitt	Stem rust causing globose galls.
<u>Fomes applanatus</u> (Pers. ex Wallr.) Gill.	B. poplar	Laurence Lake	Sap rotting fungi.
<u>Fomes igniarius</u> (L. ex Fr.) Kickx	T. aspen Birch	Grovedale Slave Lake	White trunk rot.
<u>Hypoxyylon pruinatum</u> (Klotzsche) Cke.	T. aspen	Hythe	Stem canker.
<u>Peridermium coloradense</u> (Diet.) A. & K.	B. spruce	Grovedale	Needle rust.
<u>Septoria musiva</u> Pk.	B. poplar	Grovedale	Tar spot on leaves.
<u>Peniophora pseudo pini</u> Weresub & Gibson	L. pine	Cutbank River	Red Stain.
<u>Taphrina caerulescens</u> (Desm. & Mont.) Tul.	Oak	Beaverlodge	Oak leaf blister.

LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1960

INSECTS ● DISEASES ○

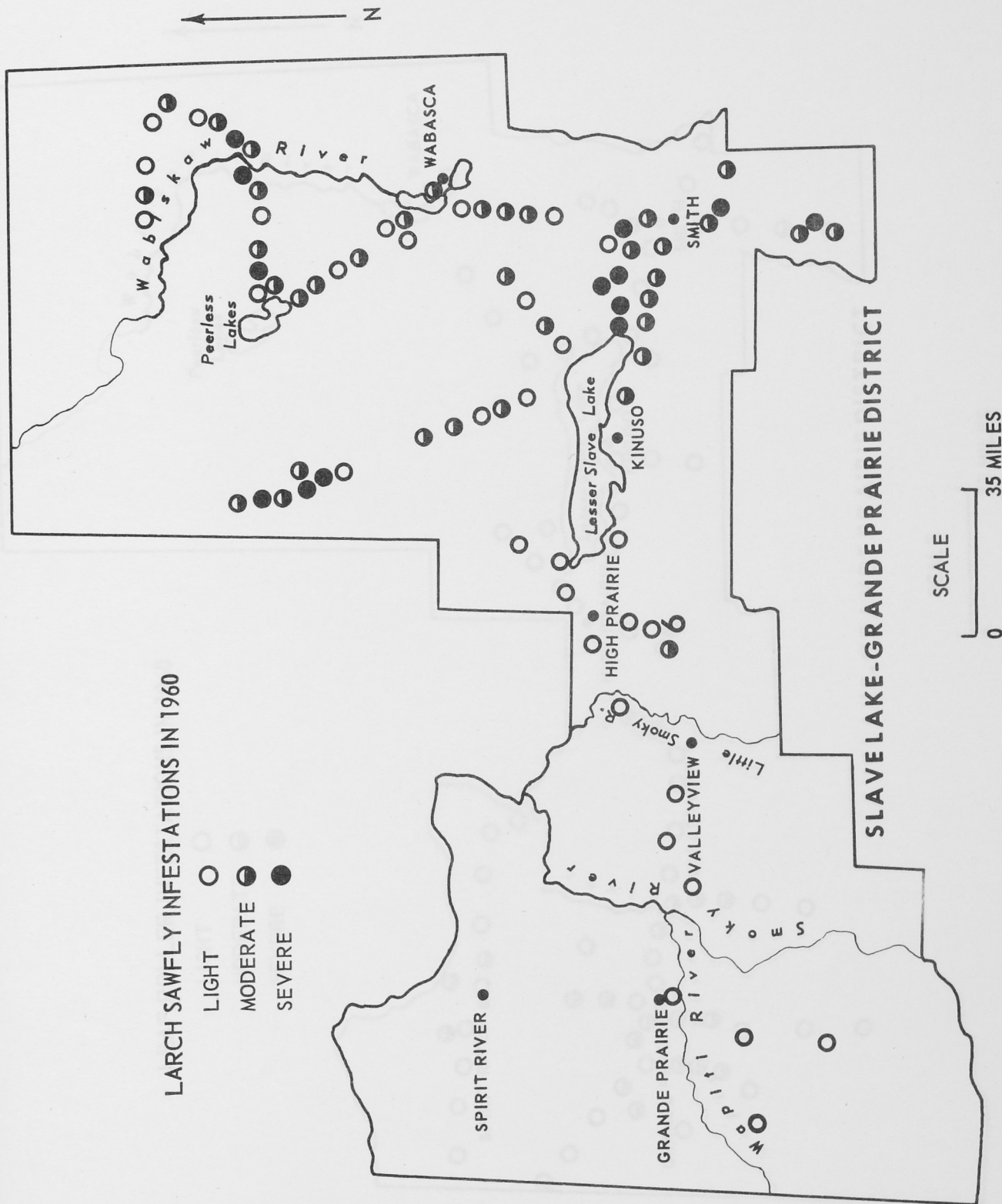


FOREST TENT CATERPILLAR INFESTIONS IN 1960



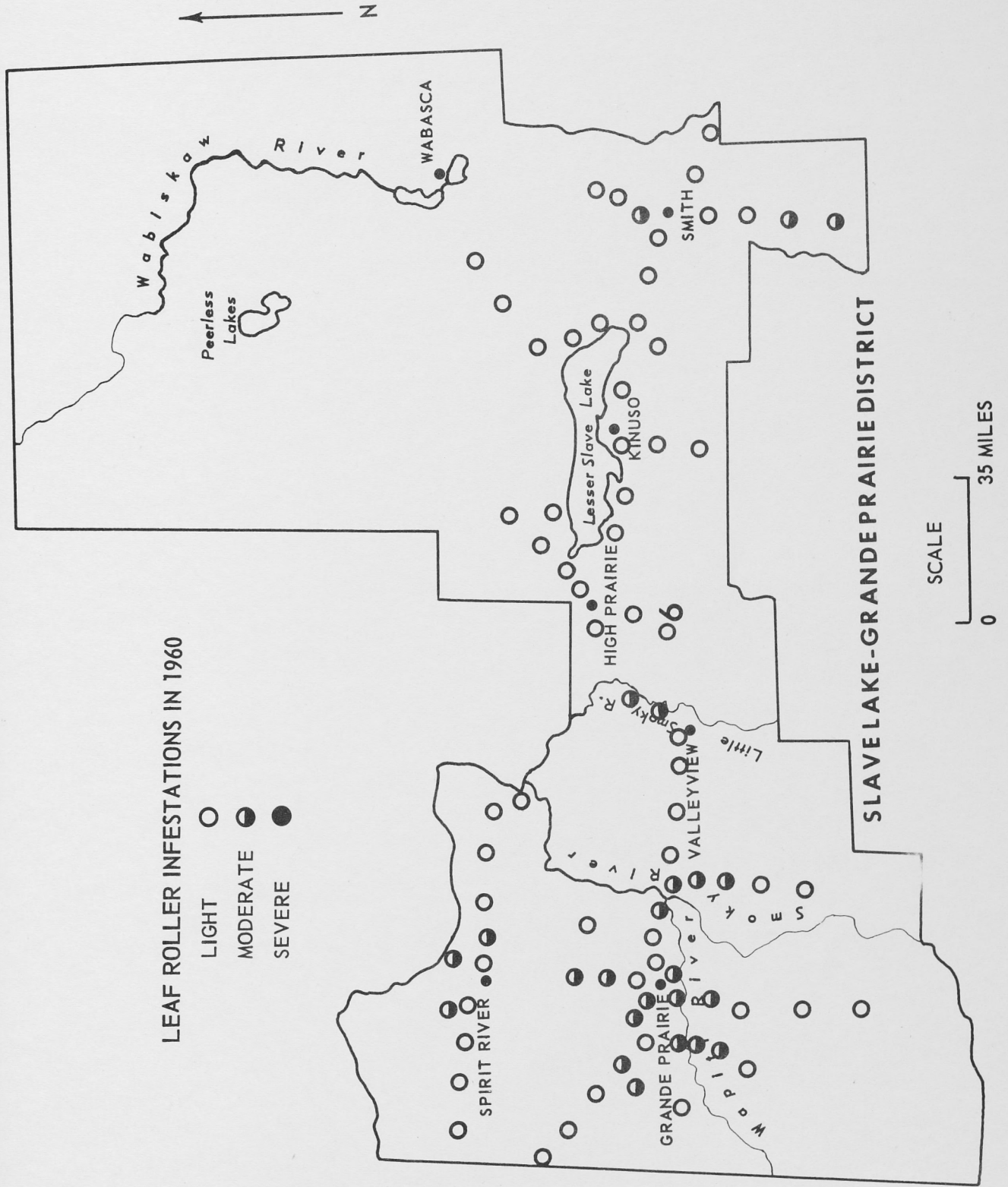
LARCH SAWFLY INFESTATIONS IN 1960

- LIGHT ○
- MODERATE ◐
- SEVERE ●



LEAF ROLLER INFESTATIONS IN 1960

- LIGHT
- ◐ MODERATE
- SEVERE



FOREST BIOLOGY RANGER REPORT

PEACE RIVER DISTRICT

ALBERTA 1960

by

A. MACHUK

FOREST ENTOMOLOGY AND PATHOLOGY LABORATORY

CALGARY, ALBERTA.

CANADA DEPARTMENT OF FORESTRY

FOREST ENTOMOLOGY AND PATHOLOGY BRANCH

MARCH 1961

INTRODUCTION

Field surveys to determine the status and distribution of forest insects and tree diseases in the Peace River District were carried out from May 19 to September 21. During this period 11,625 miles were travelled by road, 300 miles by canoe and approximately 2,300 miles by air on 3 aerial surveys.

General weather conditions during the survey season were, for the most part, favorable. After a series of heavy rains during the latter part of May and early June a period of hot dry weather prevailed during July and August. The dry weather greatly facilitated truck travel on unimproved forestry and oil company roads, and made investigations possible in areas which are usually inaccessible. During the last 2 weeks of the field season frequent showers hindered survey activities.

The first aerial survey was carried out in early July for the purpose of checking defoliation of aspen in areas inaccessible by road and to map the boundaries of forest tent caterpillar infestations. On this survey 400 miles were flown within the District boundaries and another 950 miles were covered in Districts 5 and 6 with the Rangers in those districts.

The second aerial survey, during the latter part of August, was flown over Wood Buffalo Park and adjacent areas of the Northwest Territories to map boundaries and intensity of attack of the larch sawfly and to check spruce budworm outbreaks along the Slave River.

The third aerial survey was carried out in early September during which time the writer assisted the Ranger in charge of District 6 with a larch sawfly damage appraisal in that portion of his district north of Lesser Slave Lake.

In order to predict probable defoliation of aspen by the forest tent caterpillar in 1961, sequential sampling was conducted in 7 areas throughout the District at the close of the field season. One new sampling area was established this year at a point 26 miles southwest of Fort Vermilion where defoliation has been heavy for 2 successive years. In addition to the sequential sampling for forest tent caterpillar, mass collections of tent caterpillar larvae and cocoons were made periodically during the season for personnel of the Calgary Laboratory engaged in studies of parasites and diseases.

Phenology plots were established in young pine stands at Fort Vermilion and at a location in the Clear Hills near the Whitemud River. Measurements of selected tips were taken twice during the year. The phenology plot at Peace River was maintained and measurements were taken on a weekly basis throughout the growing season.

Sequential sampling of larch plots was carried out during the latter part of the season and several collections of larch sawfly cocoons were made for personnel of the Calgary laboratory.

There was a further northward and westward extension of the larch sawfly outbreak in the Wabasca - Fort Vermilion area, a substantial increase in area infested by the forest tent caterpillar and a further decline in Bruce spanworm populations. Although an increase of yellow-headed spruce sawflies was noted in the forested regions, insects of this species were at low population levels in the agricultural areas of the District. Leaf tiers and other leaf rolling insects were at endemic levels.

The detection of the stem rust of pine Peridermium harknessi Moore, at a location in the Clear Hills, is believed to be a new record for the District. There were no new outbreaks of tree diseases recorded in 1960. One disease outbreak recorded in 1953 was re-examined this season.

After the close of the field season approximately 3 weeks were spent assisting with the construction of a Forest Biology Ranger field headquarters at Grande Prairie.

Coniferous Hosts	Insect		Disease		Deciduous Hosts	Insect		Disease	
	Colls.	Repts.	Colls.	Repts.		Colls.	Repts.	Colls.	Repts.
Larch	31	0	0	0	T. aspen	82	0	3	0
Spruce	29	0	1	0	Willow	9	0	2	0
Pine	10	0	4	0	Birch	3	0	0	0
Fir	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	Poplar	<u>1</u>	<u>0</u>	<u>1</u>	<u>0</u>
	70	0	6	0		95	0	6	0

7.

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INSECT CONDITIONS.

Forest tent caterpillar, Malacosoma disstria Hbn.

In the Peace River District populations of the forest tent caterpillar continued to rise and areas of defoliation showed a substantial increase in 1960. The scattered infestations reported from the Peace River, Nampa and Donnelly regions in 1959, merged and encompassed an area of approximately 1,800 square miles. The area of heavy defoliation was bounded by Peace River Town, Three Creeks, Harmon Valley, Donnelly and the east bank of the Little Smoky River. Moderate to heavy defoliation was also recorded in a strip commencing on the north bank of the Peace River south of Bluesky running in a band about 20 miles wide to a point near the south shore of Cardinal Lake. Within this area complete stripping of aspen foliage in farm bluffs was centred between Bluesky and White-law. In the central portion of the District heavy defoliation occurred along the Peace River commencing at it's junction with the Cadotte River and continuing in a band 20 to 30 miles in width to within 10 miles of Fort Vermilion.

Elsewhere in the District larvae of this species were collected in low numbers from North Star along the MacKenzie Highway to High Level and eastward to Fort Vermilion, but only light scattered patches of defoliation were observed.

From observations made and data obtained during ground and aerial surveys it is estimated that the forest tent caterpillar outbreak in District 7 covered an area of 9,500 square miles in 1960, of which nearly half was heavily defoliated.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING
AND DEFOLIATION ESTIMATES
FOREST TENT CATERPILLAR

Location	Predicted Defoliation for 1960	Actual Defoliation 1960	Predicted Defoliation 1961
Whitelaw	Noticeable	Moderate	Noticeable
Peace River	Noticeable	Severe	Noticeable
Dixonville	Not noticeable	Nil	Not noticeable
Manning	Not noticeable	Nil	Not noticeable
Ft. Vermilion*	-	Severe	Noticeable
McLennan	Not noticeable	Nil	Not noticeable
Donnelly	-	Severe	Noticeable

* Plot established 1960.

Larch sawfly, Pristiphora erichsonii (Htg.)

The outbreak of larch sawfly in District 7 increased in size and intensity during 1960. The infestation continued to spread westward and northward from the Wabasca - Ft. Vermilion area and has now crossed the MacKenzie Highway north of Meander River. Heavy defoliation was continuous in all stands visible from the MacKenzie Highway commencing near Mile 260 and extending into the Northwest Territories. In the southern regions of the District moderate defoliation was recorded in scattered larch stands near Keg River, Gainshaw and Watino. In the Clear Hills area and west to the British Columbia Boundary scattered small stands and individual trees were lightly attacked, but suffered no serious damage.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLING STATIONS

Station Number	Location	Infestation class 1958	Infestation class 1959	Infestation class 1960
7 - 1	Grimshaw	Light	Light	Moderate
7 - 2	Keg River	Light	Light	Moderate
7 - 3	High Level	Light	Light	Light
7 - 4	Watino	Severe	Moderate	Moderate
7 - 5	Clear Prairie	Moderate	Light	Nil

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Mature to overmature white spruce on an island in the Peace River near the 25th Base Line suffered light to moderate defoliation. Damage was heaviest on the periphery of the island and only light defoliation occurred in the centre of the stand. Defoliation to black spruce tops by this species was also observed near Mile 102, MacKenzie Highway. These were open growing "club topped" trees and defoliation was most conspicuous in the top quarter crown. Elsewhere in the District larvae of this species were taken in beating samples from shelterbelts throughout the agricultural areas but never in high enough numbers to cause noticeable defoliation. Many of the shelterbelt owners have conducted spraying programmes during the past few seasons, thereby reducing populations to endemic levels.

Spruce spider mite, Oligonychus ununguis (Jac.)

A comparatively hot dry summer provided suitable conditions for the reproduction of this species with the result that populations showed a marked increase throughout the southern portion of District 7 in 1960. Although in most instances webbing and discoloration of needles was not considered serious there were several locations where damage to shelterbelts was recorded. A small planting in the North Star area was heavily damaged. Light to moderate damage to farm shelterbelts was recorded near Dixonville, Manning, and at Hotchkiss. Low populations of this insect were also present on shelterbelts and ornamental trees at Berwyn but caused very little needle drop.

American aspen beetle, Gonioctena americana (Schaeff.)

Larvae and adults of this insect were present in high numbers on reproduction aspen bordering mature stands in the Ft. Vermilion area. Three miles southwest of Ft. Vermilion on the trail to Jackpine Creek, larvae of this species severely defoliated approximately 2 acres of reproduction aspen.

A leaf tier, Psuedexentera improbana oregonana Wlshn.

Light populations of this leaf tier were present in most aspen stands in the Peace River District and appeared to be more numerous in areas heavily infested with the forest tent caterpillar. Although widespread, Psuedexentera sp. larvae were low in numbers and caused no appreciable damage.

Black-headed budworm, Acleris variana (Fern.)

Black-headed budworms were observed in high numbers on native spruce growing along the Peace River near Ft. Vermilion but no serious defoliation by this species was noted. Several collections were also taken from farm shelterbelts near Fairview and Grimshaw but populations were low.

Western tent caterpillar, Malacosoma pluviale (Dyar)

Several small localized infestations of this caterpillar were recorded feeding on chokecherry and rose along the Peace River from Blue-sky to Dunvegan. These infestations were widely separated and confined to small pockets of not more than 2 or 3 acres. Moderate damage to rose, chokecherry and other shrubs also occurred at a point 7 miles northeast of Cherry Point on the road to Clear Prairie.

Pine root collar weevil, Hylobius sp.

Several stands of reproduction lodgepole pine south of High Level were examined this season. Larvae were present and evidence of damage was noted at all locations checked. Populations were low, however, and only a small number of trees were affected. Spot checks of pine stands in the Clear Hills revealed evidence of root collar injury in one location 20 miles northwest of Clear Prairie. Here, also, only the occasional immature tree was attacked and no evidence of past mortality was observed.

A weevil, Pissodes sp.

Light attacks to spruce leaders by this weevil were observed at various locations along the MacKenzie Highway north of High Level. Only the occasional tree showed symptoms of damage and both black and white spruce were attacked.

Spruce budworm, Choristoneura fumiferana (Clem.)

Several collections of spruce budworm larvae were taken in beating samples from shelterbelts in the Grimshaw-Berwyn area but populations were low and no defoliation of consequence was noted.

A leaf beetle, Chrysomela semota Brown

These insects caused heavy defoliation to balsam poplar over an area of one acre near Mile 261, MacKenzie Highway. They were on the small open growing trees only.

Pacific willow beetle, Galerucella carbo (Lec.)

Several small outbreaks of this insect were recorded in the southern section of District 7. Between Fahler and the Little Smoky River, several small areas of willow were moderately skeletonized. Some skeletonization also occurred near the Whitemud River in the Clear Hills. Elsewhere in the District populations of this species were low and no noticeable damage was observed.

A sawfly, Neodiprion sp.

Young, open growing lodgepole pine in a small stand along the Shaftesbury Trail southwest of Peace River town were moderately defoliated. The outbreak was confined to approximately 2 acres. One collection of larvae of this species was also taken from growing young pine 17 miles east of Deadwood.

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TABLE IV

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE PEACE RIVER DISTRICT, 1960)

Insect Species	Number of Collections	Host(s)	Remarks
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	2	T. aspen	Collected only in northern areas.
Spruce coneworm, <u>Diorctria renicullela</u> (Grote)	3	W. spruce	Taken in low numbers from shelterbelts and "club topped" B. spruce.
A gall mite, <u>Eriophyidae</u>	3	T. aspen	Populations down from 1959.
A leaf roller, <u>Itame loricaria</u> Evers.	13	T. aspen	Collected in low numbers in most aspen stands.
Bruce spanworm, <u>Operophtera bruceata</u> (Hlst.)	6	T. aspen	Low populations throughout District.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> Cham.	8	T. aspen	Light populations Mile 120 MacKenzie Hwy. to N.W.T. boundary.
Pitch nodule maker, <u>Petrova</u> sp.	2	J. pine Lp. pine	Low populations in Peace River and Ft. Vermilion areas.
Green-headed spruce sawfly, <u>Pikonema dimockii</u> (Cress.)	3	W. spruce	Light scattered populations in association with <u>P. alaskensis</u> in shelterbelts.
Poplar borer, <u>Saperda calcarata</u> Say	2	T. aspen	Moderate populations on aspen regeneration in Peace River- Shaftesbury areas.

DISEASE CONDITIONS

Stem rusts of pine, Peridermium harknessii Moore and Peridermium stalactiforme A. & K.

Stem infections caused by P. harknessii rust fungi were recorded in 3 areas this season. These locations were: Mile 110 MacKenzie Highway, 8 miles southwest of Clear Prairie and 24 miles north-west of Clear Prairie in the Clear Hills. All collections were taken from lodgepole pine and are believed to constitute a new host record for District 7.

One collection of the rust fungi P. stalactiforme was taken from lodgepole pine in the Clear Hills 24 miles northwest of Clear Prairie. This is believed to be a new record for this disease in the Peace River District. No damage of consequence was noted at any of the locations checked.

TABLE V

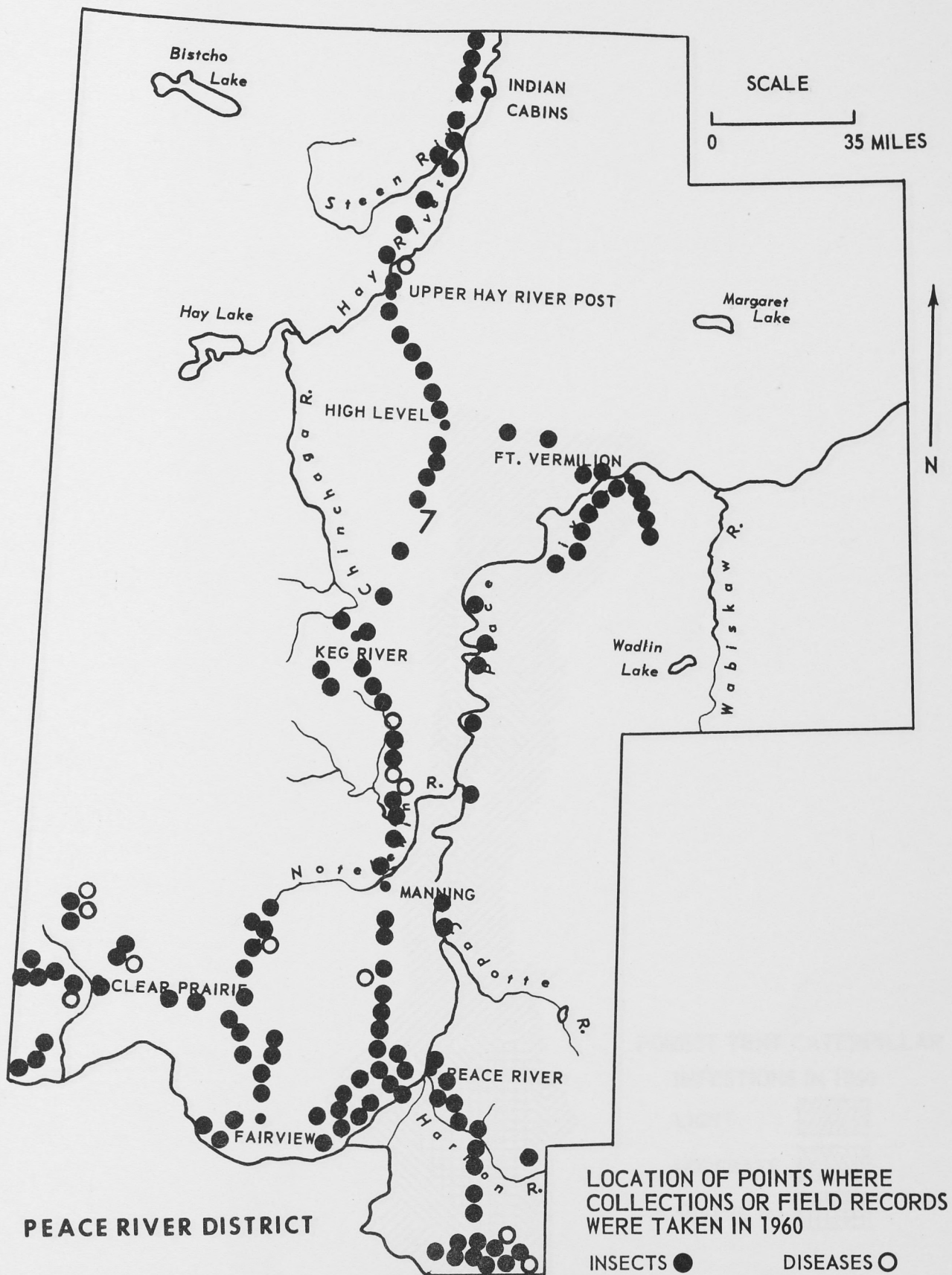
SUMMARY OF RECORDED DISEASE OUTBREAKS ACTIVE IN THE PEACE RIVER DISTRICT IN 1960.

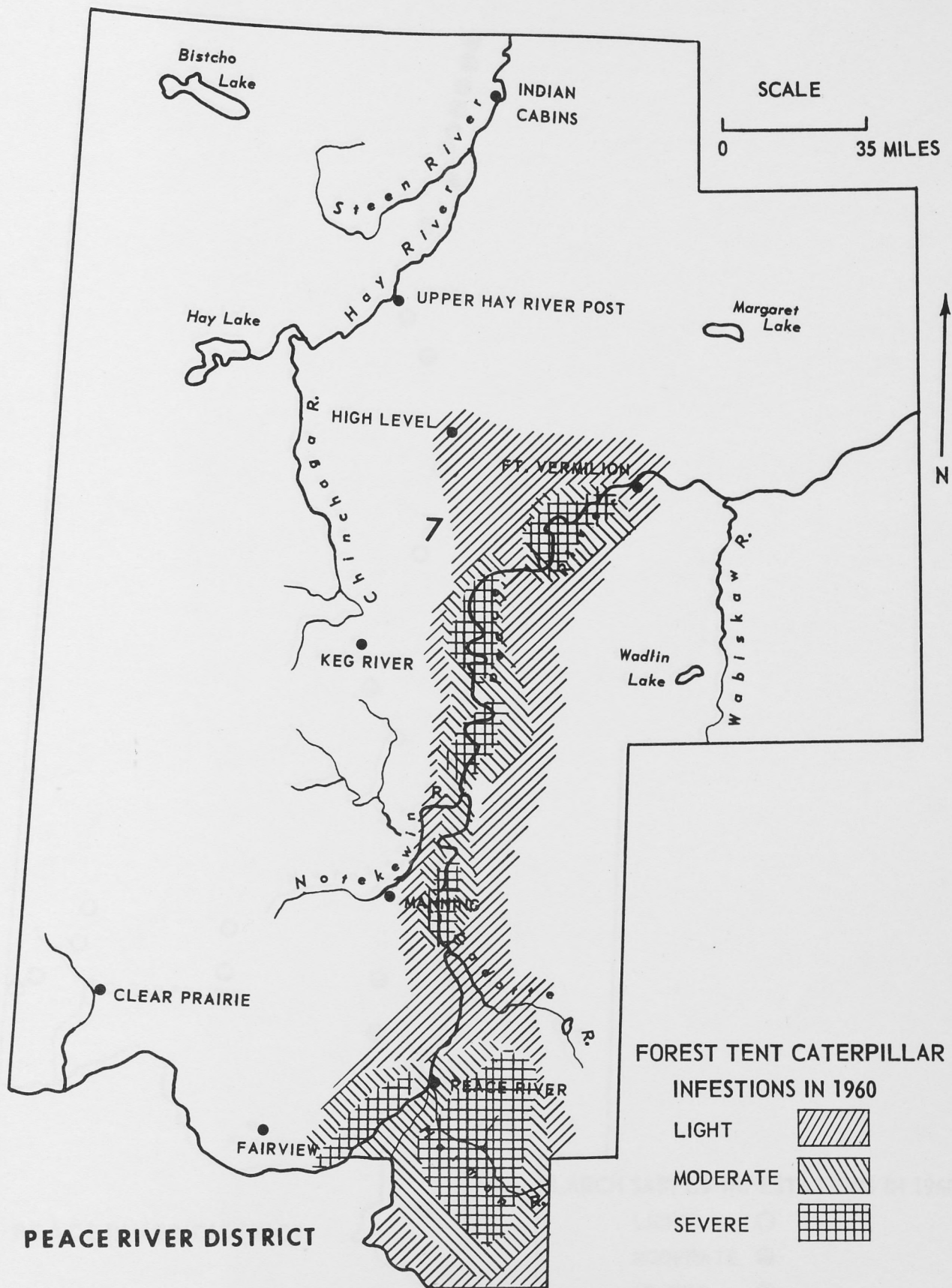
Outbreak Number	Location	Causal Organism	Remarks
7 - 1	Mile 109 MacKenzie Highway	<u>Retinocyclus abietis</u> (Crouan) Groves and Wells	Re-examined in 1960. No noticeable change

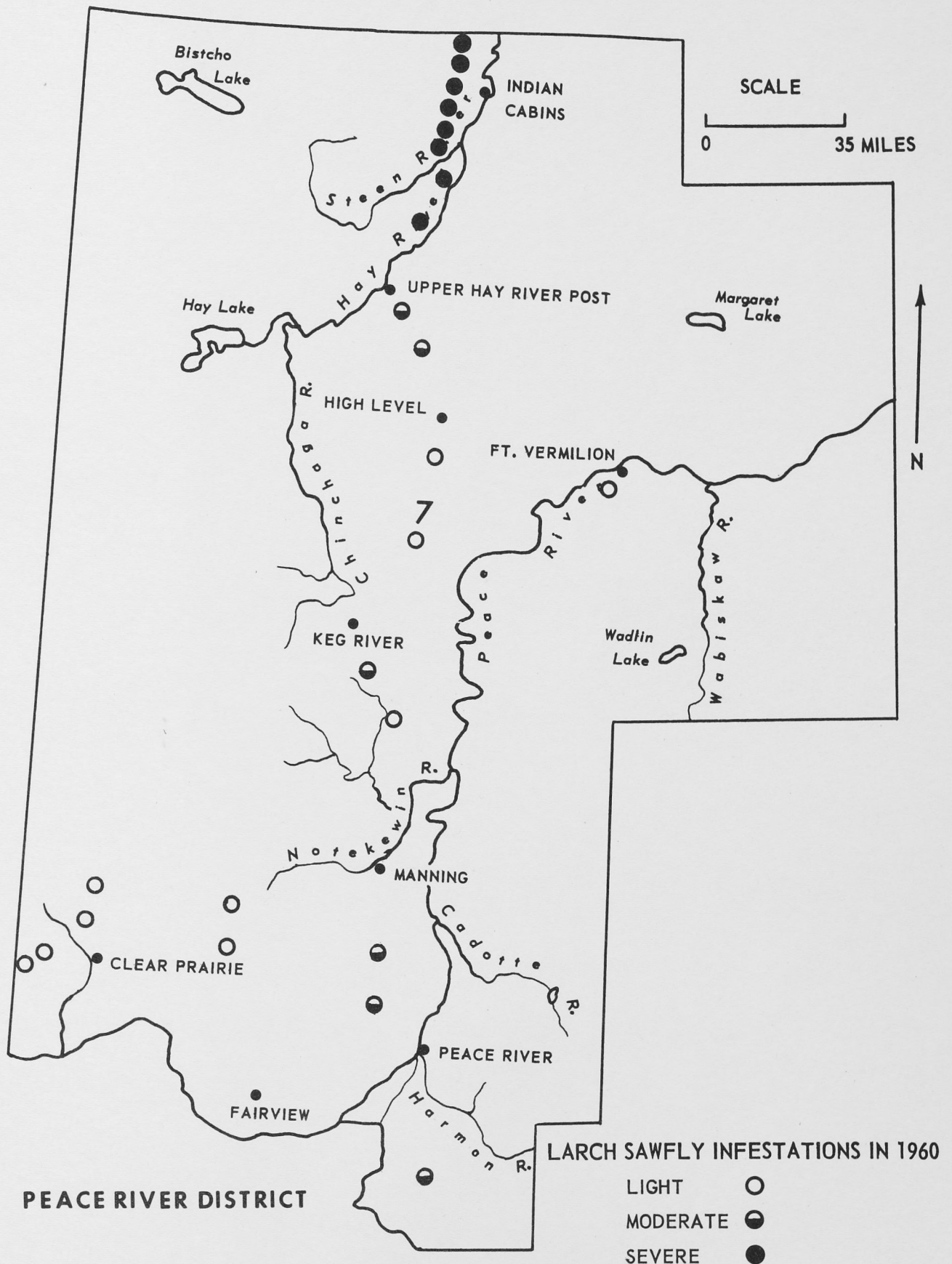
TABLE VI

SUMMARY OF DISEASE COLLECTIONS

Causal Agent	Host	Location	Remarks
Bacterial canker	T. aspen	3 miles south of Clear Hills tower and Mile 108 MacKenzie Hwy.	Unidentified canker on branches and main stem
<u>Peridermium harknessii</u> Moore	Lp. pine	Mile 110 MacKenzie Hwy., Clear Prairie, and Clear Hills.	Only the occasional rust gall observed.
<u>Peridermium stalactiforme</u> A. & K.	Lp. pine	Clear Hills	Young growth lightly infected.
<u>Melampsora epitea</u> Thum	Willow	Grimshaw	Light leaf rust.
<u>Melampsora medusae</u> Thum	T. Aspen	Mile 260 MacKenzie Hwy.	Leaf rust. Approximately 2 acres re-production infected.
<u>Pucciniastrum epilobii</u> (Pers.) Diet.	B. fir	Whitemud River	Light needle rust on scattered trees.
<u>Retinocyclus abietis</u> (Crouan) Groves & Wells	W. spruce	Mile 109 MacKenzie Hwy.	Black fungus associated with resinous cankers on immature trees.
<u>Rhytisma salicinum</u> (Pers.) Fr.	Salix sp.	Grimshaw	Tar spot common on willow in this area.
<u>Uncinula salicis</u> D.C.. Wint.)	Salix sp.	McLennan	Willow foliage heavily mildewed in small area.







FOREST BIOLOGY RANGER REPORT
NORTH WEST TERRITORIES DISTRICT
1960

by

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FOREST ENTOMOLOGY AND PATHOLOGY BRANCH
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INTRODUCTION

Forest insect and disease surveys in the Northwest Territories and Wood Buffalo Park were carried out between June 6 and August 26, 1960.

During this period approximately 1,500 miles were travelled by boat and canoe, 9,512 miles by truck, and 850 miles by aircraft. A survey by boat was made along the MacKenzie River from Fort Providence to Fort Norman. This was primarily a spruce budworm survey, during which defoliation was mapped and larvae collected for study. A general survey by canoe on Kakisa Lake and up the Horn River, was also carried out this season. All roads accessible from the MacKenzie Highway were travelled, including the completed portion of the new Yellowknife Highway.

An aerial survey was carried out from Fort Smith in late August, for which the Department of Northern Affairs and National Resources supplied 4.5 hours flying time with float aircraft and 4 hours with helicopter. On these flights the area covered included Wood Buffalo Park and the areas of the Northwest Territories bordering the Park, extending east to the Slave River, north to Great Slave Lake and west to the MacKenzie Highway.

On the Northwest Territories surveys it was noted that spruce budworm populations had changed considerably in the past year. Some areas which were moderately defoliated in 1959 were heavily defoliated in 1960. Other areas with moderate and light defoliation in 1959 had no noticeable defoliation in 1960.

The larch sawfly outbreak in the East MacKenzie District has spread westward and increased in intensity to the extent that only small areas have escaped severe defoliation.

No disease outbreaks were recorded, although a number of collections of tree diseases were taken during the survey season.

Approximately 3 weeks of the season were spent in the Peace River and Grande Prairie districts assisting with surveys and the construction of the Grande Prairie ranger cabin.

TABLE I.

SUMMARY OF INSECT AND DISEASE COLLECTIONS AND REPORTS BY HOST TREES

[illegible]

INSECT CONDITIONS

Spruce budworm, Choristoneura fumiferana (Clem.)

The outbreak of spruce budworm along the MacKenzie River was surveyed by boat between June 28 and July 7, 1960. The survey was conducted by J. Robins, G. Smith and R. Bouchier. The weather during this period was ideal for survey purposes, although considerable haze from distant forest fires reduced visibility at times.

The following categories were used in classifying damage.

Trace: Slight damage evident and larvae present in foliage.

Light: Damage to tops of trees and occasionally lower branches. No discernible discoloration of stand. Under 20 per cent of new growth destroyed.

Moderate: Noticeable defoliation of tops and understory. Color of stand reddish-brown, similar to trees with heavy cone crop. Between 20 per cent and 60 per cent of new foliage destroyed.

Severe: Discoloration of entire stands to the extent that a distinct reddish cast is visible when observed from a distance of over one mile with the naked eye. Over 60 per cent of new foliage destroyed.

Although the spruce budworm is still well established along the MacKenzie River from Fort Simpson to Fort Norman, the infested area has decreased considerably from the peak period of 1955 to 1957. During this period moderate to severe defoliation was almost continuous from Camsell Bend downriver to below Norman Wells - a distance of approximately 230 miles.

In 1960, severe defoliation occurred on both sides of the MacKenzie River from Mile 406 down river to Mile 412 at the mouth of the Blackwater River. This severe defoliation could be seen up the Blackwater River Valley for at least 6 miles.

Moderate defoliation was evident in white spruce stands along the lower Liard River in the Fort Simpson area. Along the MacKenzie River there were moderately defoliated areas between Old Fort Island and the mouth of Smith Creek, also at the mouths of the Johnson and Dahadinni rivers and between old Fort Point and Fort Norman.

Small areas of light defoliation and trace populations were observed on both sides of the MacKenzie River in isolated areas from 20 miles downstream from Fort Simpson to Fort Norman.

In the East MacKenzie District spruce budworm defoliation was observed from Mile 29 to Mile 30 on both sides of the MacKenzie Highway. This area was approximately one half mile wide. The defoliation was moderate at Mile 29, decreasing to light at Mile 30. This area was surveyed from the air on August 25, 1960, at which time the extent of the defoliated area was determined.

The outbreak of spruce budworm in white spruce stands north of Fort Smith along the Slave River continued unabated this season. Several new areas of moderate to severe defoliation were recorded. A stand of spruce approximately 20 miles north of the Salt River along the east bank of the Slave River was moderately defoliated. In the vicinity of Long Island and on the Island itself, spruce stands suffered heavy defoliation. In this area it is estimated that most trees now bear only 45 per cent of their normal foliage, due to several successive years of defoliation.

Many of the smaller trees of the understory were completely stripped of foliage. Mortality of several spruce tops was noted in this area. No defoliation was observed south of Fort Smith along the Slave or Peace rivers.

Larch sawfly, Pristiphora ericksonii (Htg.)

In the East MacKenzie District, the aerial survey conducted in 1959 revealed heavy defoliation of larch, extending from Fort Smith north to Great Slave Lake and west to within a few miles of Buffalo Lake. Aerial surveys in 1960 showed that the outbreak had increased in size and had spread west of the Mackenzie Highway and north to within 35 miles of Hay River.

Defoliation to larch was heavy from Fort Smith to Great Slave Lake and west to Dawson Landing. From this point the boundary of the outbreak swung southwesterly to Alexander Falls and continued west across the MacKenzie Highway in the heavy category. The western limit of the outbreak is not known.

Heavy defoliation of all larch stands was evident south of Fort Smith to Lake Claire and west to Davidson Lake, north to Connibear Lake and northeast to Fort Smith. A survey along the southern boundary of Wood Buffalo Park also revealed heavy defoliation of larch. Observations from these flights indicated that most larch stands in the Park were heavily defoliated.

In the western part of the District traces of defoliation were observed at Kakisa Lake and 46 miles north of Fort Providence along the highway to Yellowknife.

Engelmann spruce weevil, Pissodes engelmanni Hopk.

These insects were found attacking numerous young spruce in the Fort Smith area and also near Davidson Lake in Wood Buffalo Park. Along the Providence to Yellowknife Highway they occurred sporadically wherever there was young white spruce. No evidence of this weevil was found along the MacKenzie River.

Pitch nodule-makers, Petrova spp.

In the Fort Smith area some of the regeneration Jack pine up to one inch DBH. were girdled by these insects, probably the species metallica. This girdling resulted in very noticeable dead tops and drooping leaders. The species albicapitana appeared to be widely distributed in this area also, but the damage was negligible. This species was also found along the Alberta Escarpment between Enterprise and Fort Providence.

TABLE II

OTHER NOTEWORTHY INSECTS
(WHICH OCCURRED IN THE NORTHWEST TERRITORIES DISTRICT, 1960)

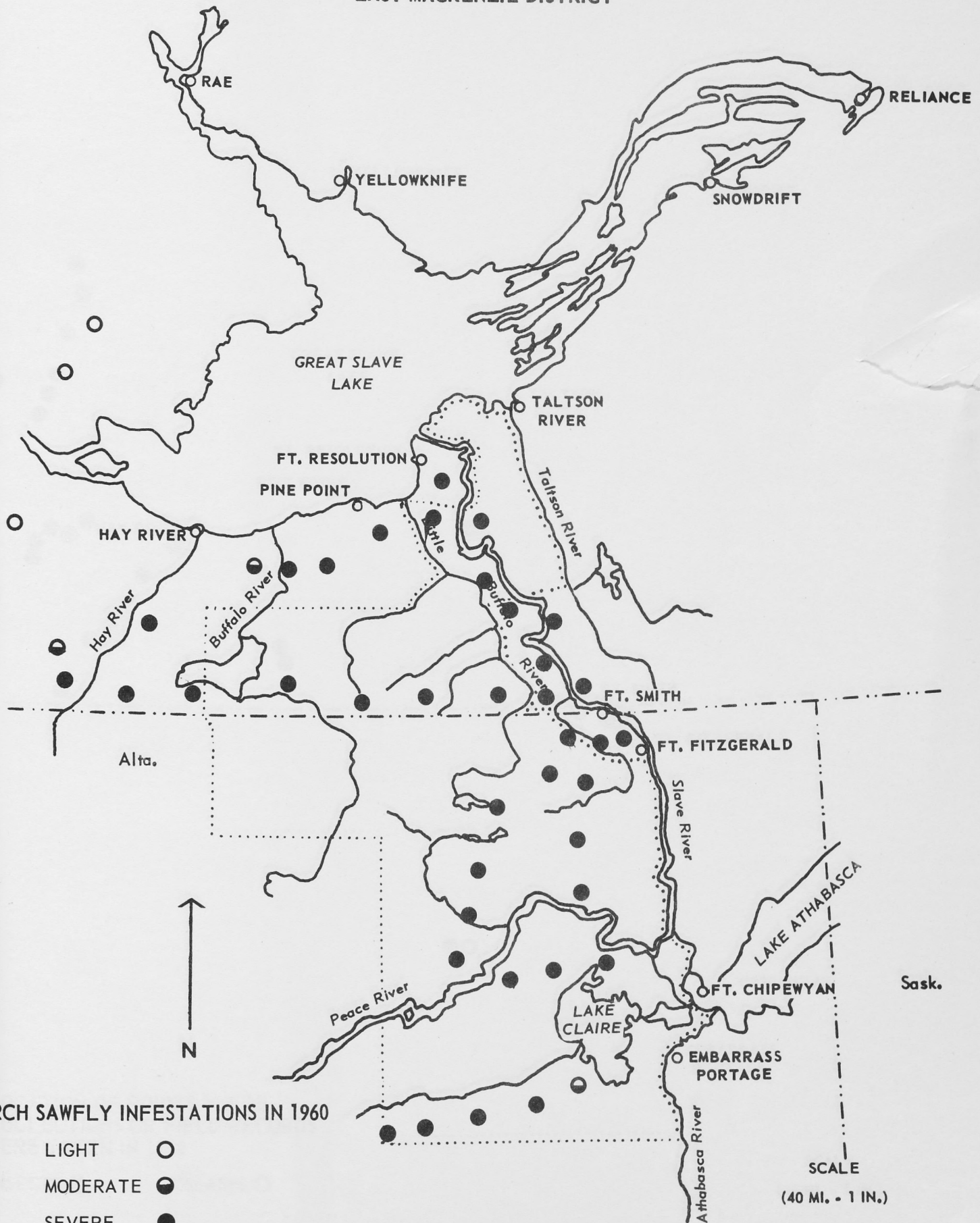
Insect Species	Number of Collections	Host	Remarks
Spruce coneworm, <u>Dioryctria</u> sp.	5	W. spruce B. spruce	Found feeding in spruce tops throughout the District.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	1	W. spruce	Moderate damage to trees in small area at Copp Lake.
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst.)	1	T. aspen	Few observed at Caen Lake north of Fort Providence.
Poplar gall aphid, <u>Pemphigus</u> sp.	2	T. aspen	Numerous galls found in Fort Providence area.
Poplar serpentine miner, <u>Phyllocnistis populiella</u> cham.	1	T. aspen	Quite noticeable damage in Fort Simpson and Wrigley areas.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	3	T. aspen W. spruce B. spruce	Small numbers found in West MacKenzie District.
Bark beetles, <u>Scolytidae</u>	1	Larch	Found in one location attacking living trees.

DISEASE CONDITIONS

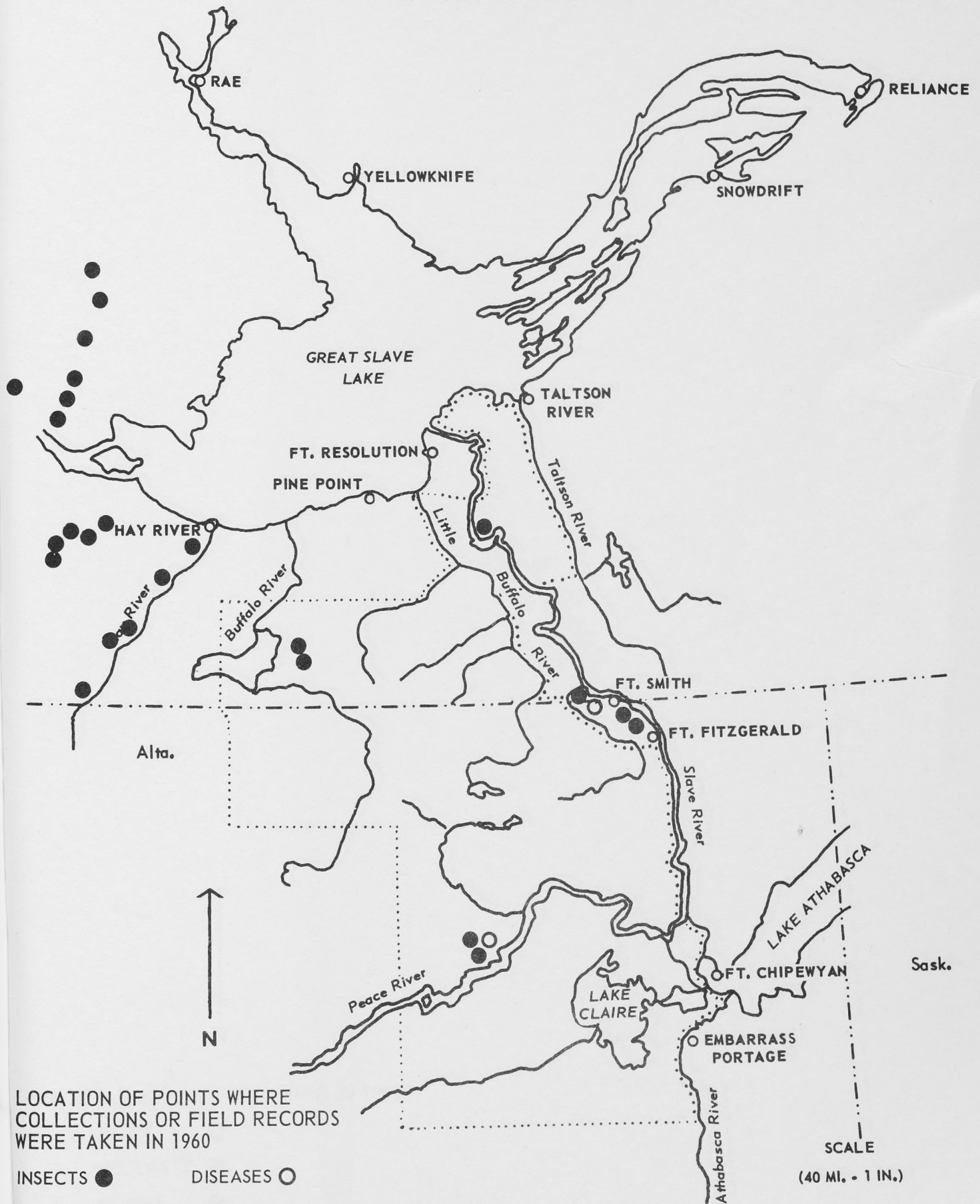
TABLE III
SUMMARY OF DISEASE COLLECTIONS

Causal Agent	Host	Location	Remarks
<i>Chrysomyxa pirolata</i> Wint.	W. spruce	Fort Smith	Yellow cone rust Prevents seed formation
<i>Peridermium harknessii</i> Moore	J. pine	Davidson Lake	Rust galls on stems capable of serious damage
<i>Fomes pinicola</i> (Sw. ex Fr.) Cke.	W. spruce	Fort Simpson	Brown heart rot in dead trees
<i>Marssonina tremuloides</i> Kleb.	T. aspen	Fort Providence	Poplar leaf spot, not serious
<i>Melampsora epitea</i> (Kinze & Schmidt.) Thüm.	Willow	Fort Providence	Leaf rust, not serious
<i>Polyporus volvatus</i> Pk.	W. spruce	Fort Simpson	Grey sap rot in stored logs

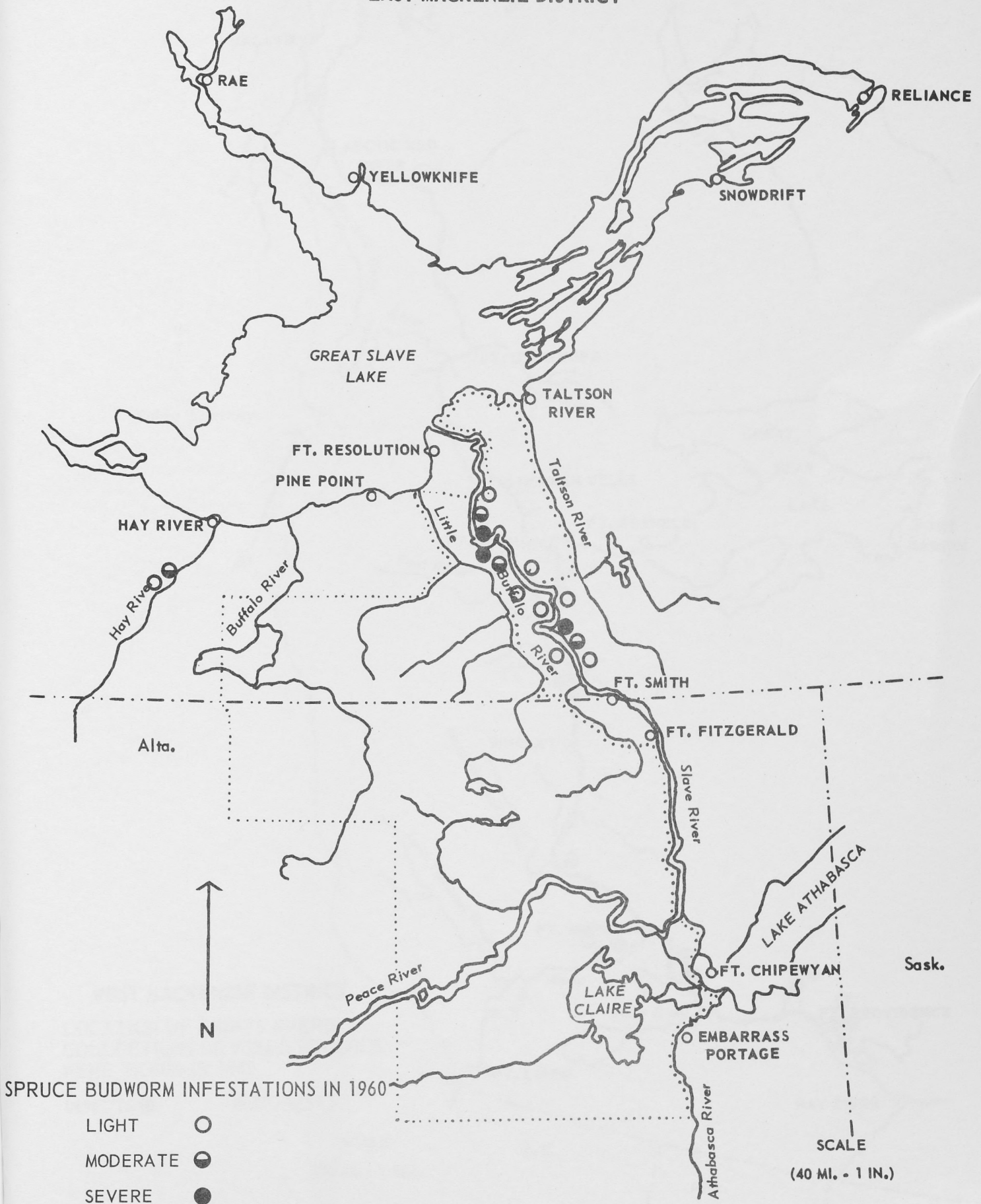
EAST MACKENZIE DISTRICT

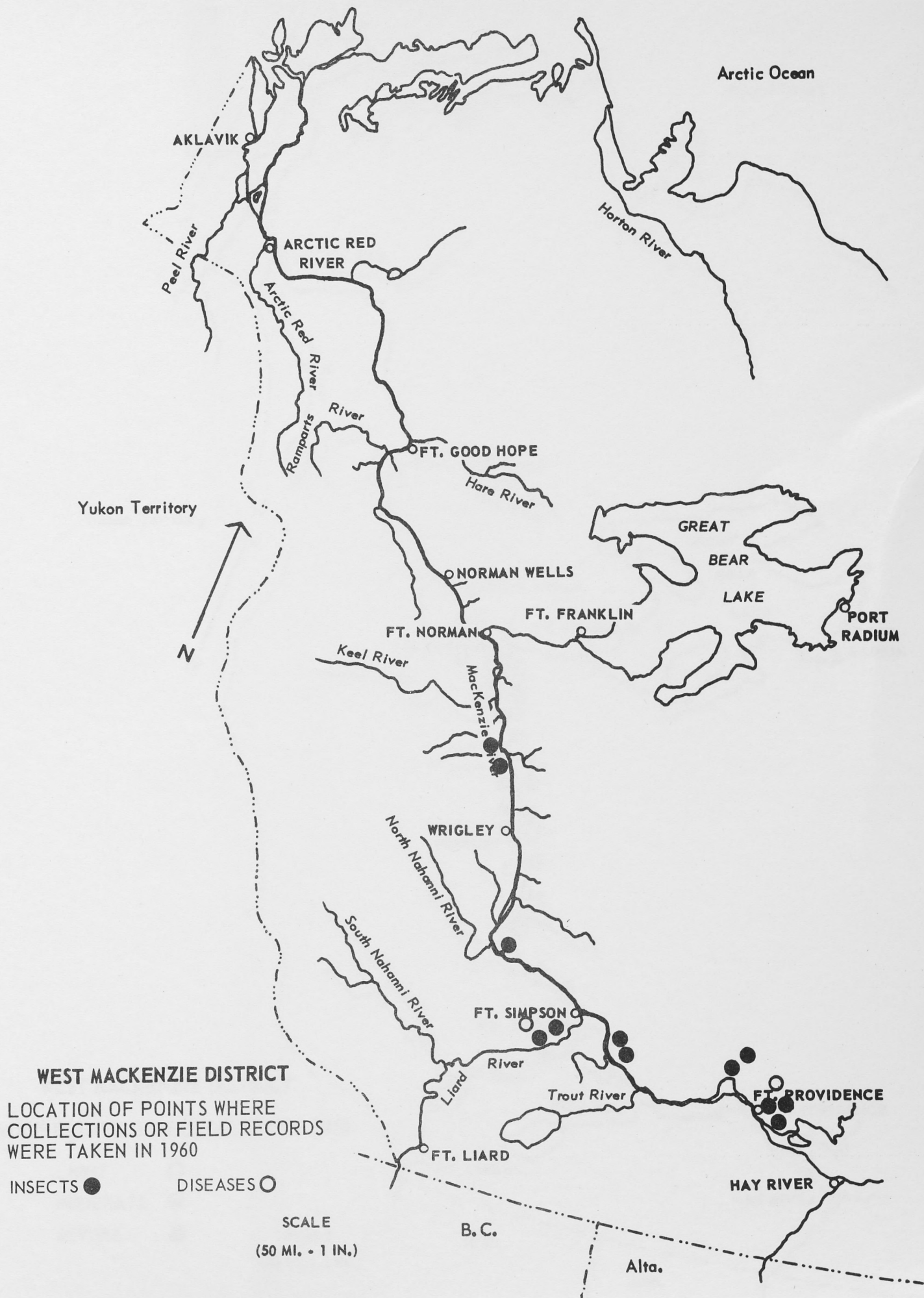


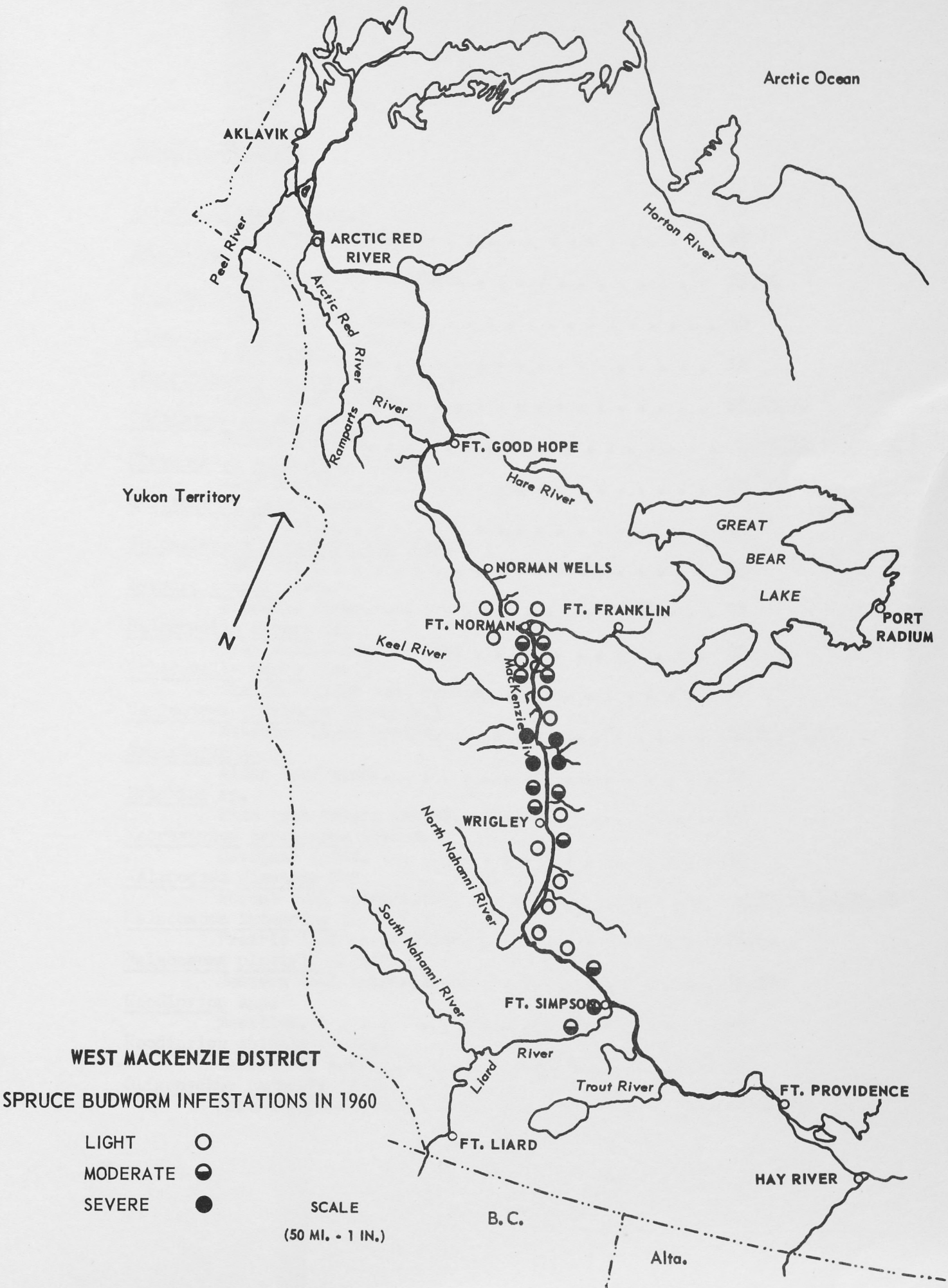
EAST MACKENZIE DISTRICT



EAST MACKENZIE DISTRICT







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